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A TAXONOMIC REVISION OF *DOMBEYA* SECT. *DECASTEMON* (MALVACEAE)[1]

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Abstract

Dombeya Cav. (Malvaceae) as presently defined encompasses over 200 species and considerable morphological variation. Within the 2- to 3-carpellate *Dombeya* subg. *Xeropetalum* (Delile) K. Schum., almost half of the recognized species belong to *Dombeya* sect. *Decastemon* Planch., which is endemic to Madagascar and traditionally distinguished by its umbellate rather than cymose inflorescences. The most recent taxonomic treatment of this section recognized 47 species and numerous infraspecific taxa; an additional species referable to this group was recently described. The present treatment recognizes 41 species and 11 subspecies. Six species (*D. micrantha* Appleq., *D. milleri* Appleq. & Bosser, *D. pauciflora* Appleq., *D. pilosissima* Appleq. & T. Andriam., *D. ratovosonii* Appleq. & Bosser, *D. vohemarensis* Appleq.) are newly described, and one (*D. ramiovensis* (Arènes) Appleq. [≡ *D. farafanganica* Arènes subsp. *ramiovensis* Arènes]) is newly elevated to specific rank. *Dombeya parvipetala* Arènes, which (like *D. pilosissima*) has a small, dichotomously branching cymose inflorescence, is transferred from *Dombeya* sect. *Xeropetalum* (Delile) Planch. to *Dombeya* sect. *Decastemon*. The following names are transferred: *D. ambalabeensis* Arènes subsp. *analavelonae* (Arènes) Appleq. [≡ *D. analavelonae* Arènes], *D. decanthera* Cav. subsp. *farafanganica* (Arènes) Appleq. [≡ *D. farafanganica*], *D. decanthera* subsp. *latipetala* (Arènes) Appleq. [≡ *D. farafanganica* subvar. *latipetala* Arènes], *D. subviscosa* Hochr. subsp. *ihosyensis* (Arènes) Appleq. [≡ *D. ambongensis* Arènes var. *ihosyensis* Arènes], *D. subviscosa* subsp. *sakarahae* (Arènes) Appleq. [≡ *D. ambongensis* subsp. *sakarahae* Arènes]. Subsections formerly recognized are not reliably separable by morphology, so only six series are recognized, one of them newly described (*Dombeya* ser. *Pentandrae* Appleq.) and one newly recognized at that rank [*Dombeya* ser. *Decantherae* (Arènes) Appleq.]. Placement of species into series has been greatly rearranged, although some series remain heterogeneous and are used for convenience with no assertion of probable monophyly. Consistent with published reports of hybridization in other subgroups of *Dombeya*, a number of probable hybrid specimens are noted, several of readily identifiable parentage, but are not nomenclaturally recognized.

Key words: *Decastemon*, *Dombeya*, Madagascar, Malvaceae, Sterculiaceae.

Dombeya Cav. (Malvaceae, formerly Sterculiaceae) is a woody genus native to Madagascar, the Mascarenes and Comoros, and Africa extending into the Arabian Peninsula. According to the most recent treatments, the genus includes close to 230 species; Madagascar, with almost 200 species, is the primary center of diversity. As presently circumscribed, *Dombeya* encompasses enormous variation in leaf

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and floral morphology; subgenera are defined by the possession of two or three (four) vs. five carpels. A number of smaller genera endemic to Madagascar and the Mascarenes have obvious affinities to *Dombeya* (e.g., *Helmiopsis* H. Perrier, *Trochetia* DC., *Ruizia* Cav.). Published molecular data strongly suggest that *Dombeya* is paraphyletic due to the exclusion of some of these (Le Péchon et al., 2010; Skema, 2012), even after the exclusion of an outlying lineage as *Andringitra* Skema (Skema, 2012).

Dombeya is an important component of the flora in Madagascar in terms of its range and number of species; it is found in most of the island's diverse habitat types, and many narrowly endemic species are known. While the African species were recently revised by Seyani (1991) and the Mascarene species by Friedmann (1987), the last treatment of *Dombeya* in Madagascar (Arènes, 1958, 1959) is now obsolete. Far more herbarium material has become available since these publications, including collections of a number of new species that were not seen by Arènes. Species delimitations that were made using very limited material are sometimes questionable, which may have significant negative consequences for conservation activities and decision-making (Bortolus, 2008), and botanists in Madagascar have found reliable identification of specimens using the existing literature to be difficult. An updated taxonomic treatment of this genus in Madagascar is, therefore, urgently needed.

As a step toward that goal, this paper presents a revision of *Dombeya* sect. *Decastemon* Planch., which is endemic to Madagascar and is characterized by the combination of 2- to 3- (to 4)-carpellate ovaries and, traditionally, umbellate inflorescences. The treatments of this section by Arènes (1958, 1959) recognized 47 species, as well as 13 subspecies, 14 varieties, two subvarieties, and one form. It is the opinion of the present author that Arènes was too strongly inclined toward splitting when the affinities of atypical specimens were uncertain. Hence, the number of species recognized is herein reduced to 41 (of which six are newly described) via the placement of a number of names, especially at infraspecific ranks, into synonymy. Eleven subspecies are also recognized.

Taxonomic History

The taxonomic history of *Dombeya* begins with Cavanilles' publication of the genus name (1786) and 11 species (1787). These included several species of the present *Dombeya* subg. *Dombeya* and *D. decanthera* Cav., the first published species referable to *Dombeya* sect. *Decastemon*; thus, the initial circumscription already included considerable morphological heterogeneity. Early authors (including Cavanilles [1786] himself, who simultaneously published *Dombeya* and *Assonia* Cav.) described a number of small genera, now synonymized with *Dombeya*, that did not involve species of *Dombeya* sect. *Decastemon*. The first infrageneric classification was published by Planchon (1850: 225), who subdivided *Dombeya* as then circumscribed into five sections: section *Eudombeya* Planch., section *Dombeyastrum* Planch., section *Pachythyrsus* Planch., section *Xeropetalum* (Delile) Planch., and section *Decastemon*, remarking of the last: "An genus proprium?" All species in the former three sections are referable to the present *Dombeya* subg. *Dombeya*, and specifically to *Dombeya* sect. *Dombeya*; the latter two sections are still recognized and, as presently defined, encompass the large majority of species within *Dombeya* subg. *Xeropetalum* (Delile) K. Schum. *Dombeya decanthera* was the only species included by Planchon in *Dombeya* sect. *Decastemon*, hence the type of the section. Baillon (1885a) published *Dombeya* sect. *Dombeyella* Baill., likewise containing only *Melhania decanthera* (Cav.) DC., i.e., *D. decanthera*; this section name is, therefore, nomenclaturally superfluous and illegitimate under Article 52 of the International Code of Nomenclature (ICN; McNeill et al., 2012). Less than a month later, he published two further species referable to this section in a list of *Dombeya* species that did not include sectional attributions (Baillon, 1885b).

In treating African species of *Dombeya*, Schumann (1900) recognized two subgenera, *Dombeya* subg. *Eudombeya* K. Schum. (a name not allowed under Art. 21.3 of the ICN [McNeill et al., 2012]; [= *Dombeya* subg. *Dombeya*]) and *Dombeya* subg. *Xeropetalum*, formally distinguished by having five versus two or three (rarely four) carpels. These subgenera also display different inflorescence morphologies and inconsistent but conspicuous trends in vegetative features, so that most species can immediately be identified to subgenus without observing the gynoecium; however, it is possible that neither is monophyletic relative to the other (Skema, 2012). Later authors have consistently followed this division. The next major treatment of Malagasy species was by Hochreutiner (1926), who recognized two sections within *Dombeya* subg. *Xeropetalum*, *Dombeya* sect. *Paradombeyastrum* Hochr., and *Dombeya* sect. *Paratrochetiella* Hochr., corresponding to *Dombeya* sect. *Decastemon* and *Dombeya* sect. *Xeropetalum*, respectively. *Dombeya* sect. *Paradombeyastrum* was superfluous and illegitimate due to the inclusion of *D. decanthera*; *Dombeya* sect. *Para-*

Table 1. Arènes' infrasectional classification of *Dombeya* sect. *Decastemon* Planch. All subgroup names were authored by Arènes (1958), and the number of included species follows his treatment.

Subgroup	Defining character(s)	Number of species
subsect. *Longipedicellatae*	peduncle ≤ pedicels	
ser. *Squamigerae*	ovary lepidote	1
ser. *Selinala*	ovary stellate	
subser. *Merika*	petals narrow, petioles glabrous	5
subser. *Digynae*	petals narrow, at least young petioles stellate	9
subser. *Decaryanae*	petals suborbicular	4
ser. *Valafotsy*	ovary glabrous	
subser. *Sely*	pedicels stellate	3
subser. *Mafimafy*	pedicels glabrous or glabrescent	9
subsect. *Decantherae*	peduncle ≥ pedicels	
ser. *Lepidotae*	ovary lepidote	1
ser. *Mananarenses*	ovary stellate	
subser. *Australes*	pedicels glabrous or glabrescent	4
subser. *Lavasoenses*	pedicels stellate	8
ser. *Apikyenses*	ovary glabrous	3

trochetiella was legitimate because the African type of *Dombeya* sect. *Xeropetalum* (*Xeropetalum quinquesetum* Delile [≡ *D. quinqueseta* (Delile) Exell]) was not included. Hochreutiner recognized 12 species in the section corresponding to section *Decastemon*, seven of them newly described, in addition to four varieties.

Arènes (1958, 1959) provided the next, and until now the most recent, complete treatment of *Dombeya* sect. *Decastemon*. He recognized 47 species, 37 of them newly described, as well as numerous infraspecific taxa. His elaborate infrasectional classification (Table 1) divided the section first into two subsections, *Dombeya* subsect. *Longipedicellatae* Arènes and *Dombeya* subsect. *Decantherae* Arènes, based on whether the peduncles were mostly shorter or mostly longer than the pedicels. Within each subsection, a triad of series was defined by ovary indument (stellate, glabrous, or lepidote, the last state being rare in both subsections). In three of the resulting series, two or three subseries were recognized based on variation in petiole or pedicel indument and, in one, petal shape. Types of subgroups were not specified, but in all cases where more than one species was included within a series or subseries, the epithet was derived from the epithet of an included species, which thereby automatically becomes the type, following Article 22.6 of the ICN (McNeill et al., 2012).

Most recently, Skema and Dorr (2010) described a very distinctive new species, *Dombeya gautieri* Dorr & Skema, without specifying its infrageneric placement. This and two related species described in this paper are, based on inflorescence and leaf morphology, best placed in *Dombeya* sect. *Decastemon*.

Circumscription of *Dombeya* sect. *Decastemon* and Infrasectional Classification

Dombeya sect. *Decastemon* has been a morphologically well-defined group, easily recognized by its delicate umbellate inflorescences, in contrast to the cymose inflorescences of *Dombeya* sect. *Xeropetalum*. The present revision complicates this picture by transferring *D. parvipetala* Arènes from *Dombeya* sect. *Xeropetalum* into *Dombeya* sect. *Decastemon* and by placing the newly described *D. pilosissima* Appleq. & T. Andriam. into that section. Both species have few-flowered, relatively symmetrical cymes, whereas the inflorescences of *Dombeya* sect. *Xeropetalum* are usually more asymmetrically branched and often many-flowered, and each has other morphological features that suggest affinities with specific subgroups of *Dombeya* sect. *Decastemon*. In addition, the inclusion of *D. gautieri* and two related species with five short, oppositisepalous fertile stamens substantially increases the range of floral morphology represented within the section.

Molecular data do not suffice to confirm the monophyly of the section, much less of any infrasectional groups. The study by Le Péchon et al. (2010) provides no information on relationships within *Dombeya* sect. *Decastemon*. Skema (2012) included six accessions from five species of *Dombeya* sect. *Decastemon* in a phylogeny within which the section appeared to be polyphyletic. However, her topology was for the most part weakly supported and somewhat problematic: one of the better-supported results relevant to this group placed one collection of *D. australis* Scott-Elliot as sister to *D. farafanganica* Arènes [= *D. decanthera*] rather than to a second collection of *D. australis*. It is worth noting that one of

Table 2. Infrasectional classification within *Dombeya* sect. *Decastemon* Planch. and included species groupings as accepted herein.

Series	Species included therein
I. *Dombeya* ser. *Apikyenses* (4 species)	*D. apikyensis*, *D. aquifoliopsis*, *D. midongyensis*, *D. ramiovensis*
II. *Dombeya* ser. *Decantherae* (2 species)	*D. decanthera* (3 subspecies), *D. lavasoensis*
III. *Dombeya* ser. *Mananarenses* (7 species)	*D. australis* (2 subspecies), *D. capuroniana*, *D. mananarensis*, *D. mandenensis*, *D. mangorensis*, *D. ranofotsyensis*, *D. rariflora*
IV. *Dombeya* ser. *Pentandrae* (3 species)	*D. gautieri*, *D. milleri*, *D. ratovosonii*
V. *Dombeya* ser. *Selinala* (13 species)	*D. ambalabeensis* (3 subspecies), *D. ambohitrensis*, *D. anakaensis*, *D. danguyi*, *D. digyna*, *D. micrantha*, *D. parvipetala*, *D. sakamaliensis*, *D. selinala*, *D. sely*, *D. subviscosa* (3 subspecies), *D. tulearensis*, *D. vohemarensis*
VI. *Dombeya* ser. *Squamigerae* (11 species)	*D. andrahomanensis*, *D. decaryana*, *D. lecomtei*, *D. lecomteopsis*, *D. longipedicellata*, *D. merika*, *D. pauciflora*, *D. seyrigiana*, *D. tavia*, *D. tsiandrensis*, *D. tubulosoviscosa*

two species of *Dombeya* sect. *Decastemon* that the study suggested to be sister lineages to the remainder of *Dombeya* s. str. is the very distinctive *D. gautieri*. However, the other is *D. mandenensis* Arènes, which in its morphology seems to show clear affinities with the "derived" *D. australis* and related species. Molecular data strong enough and including sufficient species to support a major phylogenetically based reclassification of *Dombeya* subg. *Xeropetalum*, therefore, do not exist. Further, sequence data will not be available in the near future from many taxa that are known from only one or a few older collections, including some entire groups of species.

Infrasectional classification is highly desirable for the sake of convenience, given the number of species involved and the complexity of morphological variation, but the question of how to do this is a difficult one. Arènes' (1958) classification is essentially artificial, with groups based largely on single characters that are known to vary homoplasiously within the genus, and hence is of little predictive value. Worse, as can be seen from the greater amount of herbarium material available today, those characters are not entirely reliable for specimen identification. Notably, the types of the glabrous-ovaried *Dombeya* ser. *Valafotsy* Arènes and the stellate-ovaried *Dombeya* ser. *Selinala* Arènes are referable to the same variable species, *D. selinala* Arènes. A distinctive group of species with similar petal morphology is scattered among both series, along with other species that do not belong to that group. Hence, some alteration of infrasectional classification is plainly necessary. However, the extent and pattern of variation within this section (and the entire genus) make it impossible to have confidence in the monophyly of most morphologically defined groups.

Under these circumstances, a relatively simple classification, i.e., dividing the section into series each containing a manageable range of morphological variation, seems preferable. These series may be useful for identification of specimens but are not asserted to be monophyletic as herein circumscribed (summarized in Table 2). A proliferation of ranks should be avoided, as a complicated hierarchical classification implies opinions regarding evolutionary relationships that cannot be supported. The circumscriptions of Arènes' two subsections are strongly correlated with habitat preferences, but there is not one morphological character that reliably separates them (peduncle and pedicel length being too variable within some species to allow specimens to be keyed out consistently). Thus, the subsections are of no practical utility and are not herein recognized.

Morphology

Potentially informative vegetative characters include leaf shape, relative petiole length, leaf venation, the presence or absence of domatia, and the indument of the twigs, leaves, and petiole. The shape of the leaf, including the base and apex, often varies to a certain degree within species; however, certain subgroups are characterized by having leaves usually broadest below or above the midpoint, in either case often tending toward elliptical or oblong-elliptical in some species. In all but one species, small glands are borne in the leaf margins. Secondary venation is usually best described as semicraspedodromous (following the terminology recommended by Ellis et al. [2009]), with veins usually weakening greatly before the margin, a branch or the vein itself terminating at a leaf gland, and lateral branches connecting to neighboring secondary veins by an irregularly reticulated network. There are a few exceptions; notably, three species have genuinely reticulodromous venation on much or all of the leaf. The number of basal and secondary veins can be

useful characters, although the latter in particular is quite variable. The venation is always visible on the abaxial leaf surface, though it is occasionally quite weak or unusually prominent; it is usually visible on the adaxial surface as well, but in a few species is inconspicuous or barely visible. Leaf margins are usually somewhat toothed or wavy; the glands may project slightly or may be borne consistently in the apices of larger teeth, or may be variably placed between teeth or in concave portions of the margin. Very rarely, leaf glands may be entirely absent. Domatia, previously reported from very few species of *Dombeya* (Arènes, 1958; Seyani, 1991), are very common in two series, while being rare or absent in others; unfortunately, their presence is usually not ubiquitous in those species for which substantial material is available, complicating their use for identification.

Vegetative parts may be glabrous or bear stellate trichomes, fimbriate-lepidote scales, small irregular scales, pale or reddish papillae, long unbranched hairs, or very small papillae that sometimes co-occur with stellate trichomes. Indument is sometimes consistent within species, sometimes highly variable. Two-dimensional, short-fimbriate lepidote scales and highly three-dimensional multibranched stellate trichomes may be seen as the extremes of a continuous range of variation that includes a wide variety of intermediates that can be difficult to characterize. Commonly seen forms include long-fimbriate scales and morphologies here termed "scaly stellate" (usually with a well-developed center and relatively short, irregularly three-dimensional or somewhat flattened arms) and "flat-stellate" (a small stellate hair, with most of the diameter consisting of a single rank of fine arms that radiate perpendicular to the leaf surface). Though no one species displays both fully lepidote and fully stellate indument, it is frequent for a single species to display more than one intermediate, and scaly stellate indument can often be viewed as either lepidote or stellate, depending on minor individual variations and viewer expectations.

Stipules, usually small and caducous, are occasionally long and/or persistent. Stipule size can be highly variable within species, perhaps being longer on main twigs than on short side shoots (Skema & Dorr, 2010), but for many species herbarium material is inadequate to determine the natural range of variation, as stipules do not persist on fertile specimens with mature leaves. In most of the species formerly placed in *Dombeya* subsect. *Decantherae*, the stipule base is thickened dorsiventrally and sometimes broadened as well and leaves a stipule scar that is broad and sometimes long, usually broadly hemielliptical to irregularly crescent-shaped, often pale with a spongy or fleshy appearance and often prominently raised at the margins; this character is correlated with leaf morphological characters and is useful in the circumscription of series. Because stipule scars in many species of the cymose-inflorescenced *Dombeya* sect. *Xeropetalum* are also at least slightly broadened and often slightly prominent, this may be the primitive state within *Dombeya* subg. *Xeropetalum* as a whole, though it is developed to an extreme degree in some species of *Dombeya* ser. *Mananarenses* Arènes as herein circumscribed. The inconspicuous linear or narrowly elliptical stipule scars of most species in four series are hypothesized to represent a derived condition.

Relative lengths of the peduncle and pedicels have been considered a critical character in this group, and most species indeed reliably have peduncles that are either distinctly shorter or distinctly longer than the pedicels; further, otherwise relatively cohesive groups of species tend to share the same character state. However, some species have peduncles and pedicels that are, at least sometimes, of relatively similar average length, so that peduncles both longer and shorter than the pedicels may be seen in different individuals or in different inflorescences of the same individual; in a few normally long-peduncled species, very short peduncles occur as an occasional aberration. Arènes (1958, 1959) placed a few such species within *Dombeya* subsect. *Decantherae*, which was putatively defined by the character of long peduncles, along with one species with consistently short peduncles and pedicels (*D. rariflora* Arènes) and another with solitary flowers that have moderately long pedicels and no peduncles (*D. lavasoensis* Arènes). Though those decisions were largely justified by the overall morphology of the included species, it is clear that despite the undeniable usefulness of the character of inflorescence proportion, it cannot be employed as the sole factor defining a subgroup.

Although the inflorescence normally appears umbellate except in *Dombeya parvipetala* and *D. pilosissima*, very short basal branching that makes the inflorescence an umbelliform cyme is seen at least as an aberration in some species; material is sometimes too limited to determine whether this feature is typical for a species. Other variable inflorescence characters include number of flowers, indument, and the shape, persistence, and position of bracteoles. All are too variable to be useful in defining subgroups. Infraspecific variation in indument is relatively common, often parallelling the types of indument

seen on vegetative parts; *D. mandenensis* often has a distinctive flocculent indument. Bracteole scars or persistent bracteoles in most species are located immediately or shortly beneath the flower, but in some species, the upper part of the pedicel elongates during floral expansion so that the scars after anthesis are located well below the flower, sometimes as low as the midpoint of the pedicel. Indument of the upper part of the pedicel then sometimes resembles that of the calyx. Buds are normally broadly obovoid to broadly ellipsoid, with rare exceptions; *D. danguyi* Hochr. is distinguished by near-cylindrical buds with a narrowed apex.

All species of *Dombeya* sect. *Decastemon* have hermaphroditic flowers. Floral characters useful in identification of species include the size of the flowers and the individual floral parts, petal shape, stamen number, sepal and ovary indument, and whether sepals are reflexed after anthesis. Though flower color elsewhere in the genus varies from white to pink or red, all species of *Dombeya* sect. *Decastemon* with reported flower color have white to cream petals (rarely with reddish basal spots), which dry to a dull orange color post-anthesis. Patches of nectariferous trichomes at the bases of the sepals, reported in *Dombeya* by Vogel (2000), are almost always present, though usually small and inconspicuous or concealed by the sepal cup; in a few species, they are consistently large and conspicuous. A few species have suborbicular petals that are spread open at anthesis. A large group of short-peduncled species here included within *Dombeya* ser. *Selinala*, having usually narrow, often lanceolate leaves and a western, dry-habitat distribution, is distinguished by having petals that are usually nearly symmetrical and, at anthesis or at least post-anthesis, somewhat concave apically or throughout. Some members of that series also have staminodes that are shorter than the filaments of the longest fertile stamens, whereas the more common state in *Dombeya* sect. *Decastemon* is for the staminodes to roughly equal or exceed the longest stamens. Stamen number is variable within some species (to the extent of five more or fewer than the baseline value of usually 10 or 15) but seems to be invariant within others. Unequal length of stamens within each group of two or three is typical. *Dombeya gautieri* and two newly described species consistently have five stamens that, unlike the typical condition in *Dombeya*, are oppositisepalous and so short that they are almost hidden by the ovary.

Fruit and seed characters certainly have the potential to aid in identification of *Dombeya* species. Unfortunately, little or no mature fruit has been collected for most species, including most of those for which multiple collections have been made. This dearth of specimens may be because the capsules in this section are usually only a few millimeters in size, and fruiting individuals in the field may appear to collectors to be at a relatively uninteresting post-flowering stage, with the androecium lost but fruit not yet developed, when there is actually near-mature fruit present. Available material shows useful variation in fruit size, shape (usually subglobose, varying to broadly ellipsoid or rarely cylindrical), and indument. Though two ovules per locule in flower is the norm, in most species with fruiting collections only one or two (seldom three) seeds develop per fruit; six seeds may mature, at least sometimes, in two observed species. Seeds vary in size, shape, and color; because of limited material, for some species it is impossible to confirm that apparently small or pale seeds are fully mature. A few species are observed to have an inflated ovary with considerable empty space within when the ovules are small.

Materials and Methods

Herbarium specimens at P and MO were studied, and some species were collected and observed in the field. All measurements were taken from herbarium specimens. For convenience, descriptions do not specify the absence of atypical character states (e.g., inflorescences are umbellate unless stated to be cymose; trichomes, scales, and papillae are pale unless stated to be reddish). For practical reasons, a taxonomic species concept was used whereby three fixed morphological differences were required to recognize populations as distinct species; fewer qualitative differences or overlapping quantitative differences that are geographically correlated were recognized at the subspecific level. Ecological preferences were also taken into consideration. Diagnoses of new species are given in English rather than Latin, as permitted after 1 January 2012, because English is more accessible to the scientific community in Madagascar than is Latin. Preliminary evaluation of conservation status according to IUCN Red Data List criteria (IUCN, 2001) was performed for each taxon recognized herein.

Some aberrant specimens were identified as possible or likely hybrids. Suggestions regarding the parentage of these specimens are based on morphological characters, since no genetic data are available. At least eight or possibly nine species of this section are speculated to be parents of hybrid specimens, with some parents unidentified. A majority of the species that are widespread or frequent enough to be known from more than a handful of collections are implicated in the parentage of at least one hybrid. Given the apparent frequency

of hybridization, certain previously published taxa known only from a single specimen may be suspected to be of hybrid origin; these are discussed below.

Taxonomic Treatment

Dombeya Cav., nom. cons., Diss. 2, Secunda Diss. Bot., App. [1–2]. 1786. TYPE: *Dombeya palmata* Cav. [≡ *Dombeya acutangula* Cav.], designated by Green in Prop. Brit. Bot., 105. 1929.

Assonia Cav., Diss. 2, Secunda Diss. Bot., App. [2]. 1786. TYPE: *Assonia populnea* Cav. [≡ *Dombeya populnea* (Cav.) Baill.].

Cavanilla J. F. Gmel., Syst. Nat. 2: 999, 1037. 1791 [1792]. TYPE: non designatus. Gmelin included all of Cavanilles' (1787) species of *Dombeya* within *Cavanilla*, but since those species were not published with the genus (1786), the name is not illegitimate.

Walcuffa J. F. Gmel., Syst. Nat. 2: 998, 1029. 1791 [1792]. TYPE: *Walcuffa torrida* J. F. Gmel. [≡ *Dombeya torrida* (J. F. Gmel.) Bamps].

Astrapaea Lindl., Coll. Bot. (Lindley), tab. 14. 1821. TYPE: *Astrapaea wallichii* Lindl. [≡ *Dombeya wallichii* (Lindl.) Benth. ex Baill.].

Xeropetalum Delile in Cailliaud, Voy. Méroé 4: 374. 1827. TYPE: *Xeropetalum quinquesetum* Delile [≡ *Dombeya quinqueseta* (Delile) Exell].

Hilsenbergia Bojer, Ann. Sci. Nat., Bot., sér. 2, 18: 189. 1842, nom. illeg., non *Hilsenbergia* Tausch ex Meisn., 1840. TYPE: *Hilsenbergia cannabina* (Hils. & Bojer) Bojer [≡ *Dombeya cannabina* Hils. & Bojer ex Hook.].

Trees or shrubs. Leaves alternate, petiolate, stipulate, simple, highly variable in shape; margin usually ± toothed or palmately (pinnately in *Dombeya gautieri*) lobed, marginal glands frequent in some subgroups; domatia sometimes present. Inflorescences axillary or subterminal, cymose, often umbelliform, or umbellate; multibranched cymes often bracteate; bracteoles 3, free to the base. Flowers hermaphroditic or rarely dioecious; sepals 5, frequently with glandular patches at the base of the adaxial surface; petals 5, white to pink, red or yellowish, persistent; lowermost portion of androecium fused into a corona; staminodes 5; stamens 5 to 45, oppositipetalous or rarely oppositisepalous; ovary superior, 2- or 3(4)-loculed or 5-loculed; style 2- or 3(4)-lobed or 5-lobed, very rarely free to the base. Fruit a loculicidal capsule with 1 to 8 seeds per locule; seeds without wings or arils; cotyledons bifid.

Distribution and habitat. *Dombeya* is native to Madagascar, Africa (extending to the Arabian Peninsula), and the Comoros and Mascarenes. Species are most numerous and morphologically diverse in Madagascar. Habitats are highly variable.

Dombeya sect. **Decastemon** Planch., Fl. Serres Jard. Eur. 6: 225. 1850. TYPE: *Dombeya decanthera* Cav.

Leaves highly variable in shape, usually much longer than broad, usually < 15 cm long; margins usually toothed, seldom sinuate or subentire (in *Dombeya gautieri* pinnately lobed); venation usually ± semicraspedodromous (in 3 species reticulodromous, in *D. gautieri* sometimes fully craspedodromous); marginal glands almost always present; domatia absent or present. Inflorescences umbellate (in 2 species a small, dichotomously branching cyme). Sepals almost always with glandular patches, reflexed or not; petals of small to medium size (to 17 mm); stamens 5 to 15(to 20); ovary 2- or 3(or 4)-loculed. Fruit, where known, with 1 or rarely 2 maturing seeds per locule or 1 per fruit.

Distribution and habitat. *Dombeya* sect. *Decastemon* is endemic to Madagascar, where it is widely distributed and occurs in most vegetation types, ranging from dry forest and bush to humid forest.

Discussion. In the taxonomic treatment presented here, *Dombeya* sect. *Decastemon* includes 41 species, within four of which a total of 11 subspecies are recognized. Preliminary estimates of conservation status suggest that 29 species are threatened at some level (seven Critically Endangered, 11 Endangered, 11 Vulnerable), not counting four probably threatened species that are known from only a single collection but rated Data Deficient because of the inaccessibility of the locality. Nine subspecies are estimated to be threatened at some level (two as Endangered, seven as Vulnerable). Eleven species and two subspecies are known only from the type collection or, in the case of *D. mangorensis* Arènes, the type and a second specimen simultaneously collected. At least four and perhaps as many as six additional species have been collected from only a single population.

Few taxa, therefore, can be described as common. The most widespread and frequently collected species are *Dombeya subviscosa* subsp. *subviscosa* Hochr. in the northwest and *D. lecomtei* Hochr. in the drier parts of the south. The four other species or subspecies whose status was estimated as Least Concern are all southern or western. All of the taxa native to eastern humid forests are rare or narrowly distributed, although several (e.g., *D. mandenensis*, *D. australis* subsp. *grandiflora* Arènes) are locally common within their areas of endemism.

KEY TO THE SERIES OF *DOMBEYA* SECT. *DECASTEMON*

1a. Fertile stamens 5; staminodes oppositipetalous, spreading on top of petals; corona 0.2–0.5 mm, ± spreading, in two species entirely hidden beneath ovary; extreme northern Madagascar ... IV. *Dombeya* ser. *Pentandrae* Appleq.
1b. Fertile stamens (5 to)10 to 15(to 20); staminodes ± oppositisepalous, not spreading; corona variable in length, normally > 0.5 mm, erect, never hidden beneath ovary.
2a. Petals < 10 mm, symmetrical (to slightly asymmetrical), mostly convex at least around apical margin at anthesis (rarely later); leaves lanceolate to ovate (elliptical, oblong-elliptical, oblanceolate); inflorescences umbelliform, with peduncle usually shorter than pedicels, or in *D. parvipetala* dichotomizing cymes; most from dry western, southern, or northern Madagascar, rarely in the east ..... V. *Dombeya* ser. *Selinala*
2b. Petals variable in size and shape, sometimes strongly asymmetrical, not convex; leaves variable in shape, ranging from lanceolate to elliptical, oblong-elliptical, or oblanceolate to obovate; inflorescences umbelliform, with peduncle shorter or longer than pedicels.
3a. Pedicel conically thickened or sharply bent just below flower; peduncle always much shorter than pedicels; dry (to transitional) habitats ..... VI. *Dombeya* ser. *Squamigerae* Arènes
3b. Pedicel not conically thickened or sharply bent below flower; peduncle shorter or longer than pedicels.
4a. Stipule scars broad, usually hemielliptical or irregularly crescent-shaped, on young twigs pale (rarely darker than twig) and usually slightly prominent, or stipules persistent and twigs pilose.
5a. Leaves oblanceolate or narrowly elliptical to oblong-elliptical (obovate, elliptical), never pilose ..... III. *Dombeya* ser. *Mananarenses*
5b. Leaves elliptical to ovate, sometimes broadly so (to narrowly elliptical or narrowly lanceolate), midrib or entire leaf surface normally pilose ..... II. *Dombeya* ser. *Decantherae* (Arènes) Appleq.
4b. Stipule scars narrow, usually linear to very narrowly elliptical, on young twigs usually dark (pale), not prominent (bark below the proximal margin may be elevated); stipules generally caducous, twigs never pilose.
6a. Peduncle usually longer than pedicels; leaves obovate to oblanceolate or narrowly elliptical; southeastern to eastern Madagascar ..... I. *Dombeya* ser. *Apikyenses* Arènes
6b. Peduncle usually mostly shorter than pedicels (in one southwestern species, *D. seyrigiana* Arènes, similar in length or longer); leaves ovate, lanceolate, or elliptical; southeastern to eastern and southwestern Madagascar ..... VI. *Dombeya* ser. *Squamigerae*

I. Dombeya ser. **Apikyenses** Arènes, Candollea 16: 400. 1958. TYPE: *Dombeya apikyensis* Arènes.

Young twigs papillate, scurfy, stellate, or sparsely fimbriate-lepidote; stipule scars on young twigs narrow and usually inconspicuous. Leaves obovate to narrowly elliptical or less often oblanceolate (especially when immature); basal veins 1 to 5; secondary veins 4 to 8(to 10); domatia absent or present; petioles papillate or scaly to stellate or glabrate. Inflorescences umbellate, stellate to minutely papillate and/or scaly; peduncles 7–43 mm, usually longer than pedicels, sometimes in part shorter. Petals broadly obovate to obovate, asymmetrical to near-symmetrical, not convex; stamens 10 to 15; staminodes ± oppositisepalous, longer than longest fertile filaments; ovary stellate to scaly stellate or papillate.

Distribution and habitat. *Dombeya* ser. *Apikyenses* is native to humid forests at elevations from 681 to 1342 m.

Discussion. As herein circumscribed, *Dombeya* ser. *Apikyenses* includes four species with relatively long-peduncled inflorescences compared to many members of the section and small, obovate to narrowly elliptical leaves. Unlike *Dombeya* ser. *Mananarenses*, species of this series have relatively narrow and inconspicuous stipule scars. Material of all species is very limited. The series is not presumed to be monophyletic and is used for the sake of convenience. The placement of *D. ramiovensis* (Arènes) Appleq., which possesses features not otherwise seen in any of the long-peduncled species, is particularly problematic.

KEY TO THE SPECIES OF *DOMBEYA* SER. *APIKYENSES*

1a. Ovary at anthesis papillate, seldom also bearing a few stellate trichomes or scales.
2a. Leaves obovate to narrowly obovate; basal veins 1(to 3, the outer very weak); domatia absent; stamens 10 ..... 1. *D. apikyensis*
2b. Leaves narrowly elliptical to oblanceolate, occasionally to obovate or lanceolate-elliptical; basal veins 3 to 5; small domatia present on some leaves in axils of basal and/or lower secondary veins; stamens 5(to 10) ..... 4. *D. ramiovensis*
1b. Ovary at anthesis stellate or scaly stellate.
3a. Leaves irregularly crenate apically to subentire, with glands variably located; midrib not pilose; inflorescence reddish stellate; Toamasina ..... 2. *D. aquifoliopsis* Hochr.
3b. Leaves serrate at least apically, with glands in tooth apices; midrib of most leaves sparsely pilose; inflorescence pale-colored stellate (to glabrous on peduncle); Fianarantsoa ..... 3. *D. midongyensis* Arènes

1. Dombeya apikyensis Arènes, as "*spikyensis*," Candollea 16: 401. 1958. TYPE: Madagascar. Toliara: bassin de reception de la Mananara, affluent du Mandrare, pentes occidentales des montagnes entre l'Andohahela et l'Elakelaka, mont Apiky au–dessus de Mahamavo, transition du bush xérophile à la forêt basse sclerophylle, 800–900 m, Jan.–Feb. 1934 (fl.), *H. Humbert 13798* (holotype, P!; isotype, P [4]!).

Tree to 10 m; twigs grayish brown, the youngest dark or reddish to pale brown, bearing minute papillae and rare small stellate trichomes or scales; stipules caducous, deltoid, 0.5–1.8 mm, dark, bearing few minute papillae; stipule scars on young twigs narrow, not prominent. Leaves obovate to narrowly obovate, 3–6 × 1.2–3.2 cm; petiole 3–9 mm, bearing minute flattened papillae and rare stellate trichomes or scales, often glabrate and wrinkled at maturity; base cuneate; apex rounded to acute or cuspidate with rounded tip; margins crenulate on apical portion to shallowly wavy or subentire, glands inconspicuous, variably located; abaxial surface glabrous or bearing sparse minute whitish to reddish flattened papillae at least on midrib, occasionally sparsely pilose only on midrib; basal veins 1(or 3, the outer very weak); secondary veins 4 to 8 per side, slightly curved, almost craspedodromous, barely visible on adaxial surface; domatia absent. Inflorescences (3- to)5- to 10-flowered; peduncle (1–)2–4.3 cm; pedicels 5–10 mm; peduncle and pedicels bearing minute flattened papillae and sometimes rare small, flat-stellate trichomes; bracteoles caducous, ovate to lanceolate, 0.5–1.3 mm, sparsely papillate, at maturity bracteole scars immediately or slightly beneath flower. Sepals 3.5–5 mm, usually but not always reflexed at anthesis, bearing minute papillae and sometimes scales; petals white, 5–7 × 2–4.4 mm, broadly obovate or obovate, asymmetrical; corona 0.7–0.9 mm; stamens 10; filaments 0.5–1 mm, sometimes partly fused above corona; anthers 0.7–0.8 mm; staminodes linear, 3–3.5 mm; style (0.5–)1–1.3 mm; style branches two, 1.5–1.8 mm, curled or erect; ovary papillate. Fruit unknown.

Distribution, habitat, and phenology. *Dombeya apikyensis* is native to a small region of southeastern Madagascar, where it may occur in humid forest or transitional vegetation or bush at altitudes from 681 to 900 m. It flowers in January and perhaps February.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya apikyensis* is noted as Vulnerable or VU, D, with the criterion D referring to very small or restricted populations. The two known collections were made very close together and probably represent a single population; because of its limited area of occupancy, the species is vulnerable to human activities or stochastic events. Since thousands of collections have been made from Andohahela National Park, it is likely that this species is very rare or it would be more often collected.

Discussion. *Dombeya apikyensis* is distinguished by its papillate indument on leaves, inflorescences, and ovaries, and by its very narrow-based leaves that lack domatia. The epithet of *D. apikyensis*, referring to Mt. Apiky, was incorrectly rendered as *spikyensis* in the protologue of Arènes' (1958) publication (p. 401) but as *apikyensis* in the key (p. 274); the journal's volume index listed it as *apikyensis* (p. 455), with a second entry (p. 458) for "*spikyensis*, *errore: apikyensis*." The spelling was corrected in Arènes (1959) and in later databases, as permitted by Article 60.1 of the ICN (McNeill et al., 2012).

Additional specimens examined. MADAGASCAR. **Toliara:** Anosy, Parc National d'Andohahela, parcelle I, *Andriamihajarivo et al. 1098* (MO).

2. Dombeya aquifoliopsis Hochr., Candollea 3: 29. 1926. TYPE: Madagascar. Analamahitro [forêt d'Analamaitso, dans le haut bassin du Bemarivo et de l'Onilahy, Aug. 1907], bois secs, 800 m, s.d. (fl.), *H. Perrier de la Bâthie 5617* [*H. L. Jumelle 40*] (holotype, G not seen, G image!; isotypes, K not seen, K image!, P!).

Dombeya andilamenensis Arènes, Candollea 16: 397. 1958, syn. nov. TYPE: Madagascar. Toamasina: forêt de l'Anona près Andilamena, distr. d'Ambatondrazaka, 900 m, June 1938 (fl.), *G. Cours 271* (holotype, P!).

Understory shrub to 5 m; twigs grayish brown, the youngest with an indument of small irregular scales, somewhat stellate to papillose; stipules caducous, not seen; stipule scars on young twigs narrow, not prominent. Leaves obovate, or when immature narrowly elliptical to oblanceolate, 3–5.2 × 1.6–3.4 cm, coriaceous; petiole 2–5.5 mm, scaly stellate; base cuneate, rounded at the extreme base; apex cuspidate to short-acuminate or acute with a rounded tip; margins irregularly crenate apically to subentire especially in young leaves, with inconspicuous glands variably located in convex or concave portions; both surfaces sparsely stellate, mostly along main veins, or glabrous at maturity; basal veins 3(to 5), the lateral weak; main secondary veins above the base 4 to 7 per side, with weaker similar veins often interspersed, venation visible on adaxial surface, fairly prominent

on adaxial surface; domatia absent. Inflorescences (1)2- to 4(5)-flowered, sometimes bracteate probably as an aberration; peduncle, where present, 1.1–2.2 cm; pedicels (2–)8–12 mm; peduncle and pedicels reddish stellate; bracteoles caducous, ovate, 1.5–3.5 mm, stellate, bracteole scars at maturity slightly beneath flower. Sepals 4.5–5 mm, usually reflexed in late anthesis, reddish stellate to scaly stellate, glandular patches sometimes absent; petals white, (5.8–)6.8–8.5 × 5–6 mm, broadly obovate, asymmetrical; corona 1 mm; stamens 10 to 15; filaments white, 0.5–1.5 mm; anthers 0.7–1.2 mm; staminodes white, linear, 2–3.5 mm; style white, 3–5 mm, stellate basally; style branches two or three, 1.5–2 mm, irregularly curled; ovary stellate or scaly stellate. Old fruit broadly ovoid, 5.4 × 3 mm, pale, with persistent indument.

Distribution, habitat, and phenology. *Dombeya aquifoliopsis* has been collected in humid forests of eastern Madagascar at 800–900 m. It appears to be winter-flowering, with the only known flowering date in June.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya aquifoliopsis* is noted as Endangered or EN B1ab(iii)+2ab(iii). The B criterion generally refers to the geographic range as expressed by B1, extent of occurrence (EOO), or B2, area of occupancy. Only two older collections are known, and degradation of potential habitat continues in these areas.

Discussion. *Dombeya andilamenensis* was supposedly characterized by a stellate-pubescent ovary, in contrast to the scaly ovary of *D. aquifoliopsis*; the observed induments in fact reflect the possible range of morphologies for a species with rather flat-stellate or long-fimbriate scales, as is seen in several more frequently collected species (most notably *D. lucida* Baill. in *Dombeya* sect. *Xeropetalum*; Applequist, pers. obs.). The type of *D. andilamenensis* has smaller inflorescences but is barely flowering, with most inflorescences still in bud; sepal glands are lacking or nearly lacking in the type of *D. aquifoliopsis*. The two are otherwise generally similar in morphology, and the names are, therefore, synonymized.

Arènes (1958) lectotypified several of Hochreutiner's (1926) names using the P duplicate of the single collection or one of the syntypes cited by Hochreutiner. However, for *D. aquifoliopsis* Hochreutiner's publication provided internal evidence that the duplicate of the single cited specimen conserved at G (where he was then working) was the intended type. Hochreutiner (1926: 29) quotes only the label data from the G duplicate of the type: "Analamahitro, bois secs, alt. 800 m., (Herb. Perrier de la B., n. 40 de Jumelle)." The P and K duplicates, which additionally number the collection as *Perrier de la Bâthie 5617*, have different label text, as noted above, which was not quoted by Hochreutiner. Further, many of the specimens Hochreutiner cited, including Perrier specimens, have designations such as "in Hb. Paris" or "in Hb. Kew et Paris," permitting the assumption that specimens lacking such designations were located at G. Since the specimen at G was the only original material seen by Hochreutiner, it is appropriately treated as a holotype, and Arènes' lectotypification can be rejected as unnecessary.

3. Dombeya midongyensis Arènes, Candollea 16: 396. 1958. TYPE: Madagascar. Fianarantsoa: Midongy du Sud, prov. Farafangana, 23 Aug. 1926 (fl.), *R. Decary 5142* (holotype, P!; isotype, P!).

Small tree or large shrub; twigs dark brown, sparsely stellate with short trichomes; stipules sometimes persistent, narrowly lanceolate to linear, (2.5–)3.5–7 mm, stellate; stipule scars on young twigs narrow, not prominent. Leaves obovate, 3.5–6 × 1.6–3.1 cm; petiole 4–11 mm, short-stellate; base cuneate, sometimes rounded at extreme base; apex cuspidate to irregularly rounded; margins serrate at least on distal half with brownish glands in tooth apices; adaxial leaf surface sparsely stellate along main veins, often glabrate at maturity; abaxial surface sparsely stellate, often sparsely pilose on midrib; basal veins 3, the lateral weak; secondary veins 5 to 8 per side, inconspicuously visible on adaxial surface; domatia absent. Inflorescences (1)2- or 3(4)-flowered, occasionally a 3-branched bracteate cyme; peduncle 2–4.3 cm, glabrous or sparsely stellate; pedicels 8–11 mm (to 20 in solitary flowers), stellate; bracteoles caducous, lanceolate to linear, (1.5–)2.5–3.5 mm, stellate, borne immediately beneath flower. Sepals 5–6 mm, not reflexed at anthesis (some possibly becoming reflexed later), stellate; petals white, 6–8.5 × 4–6 mm, broadly obovate, nearly symmetrical; corona 1 mm; stamens ca. 15; filaments 0.6–2 mm; anthers 1–1.3 mm; staminodes narrowly spatulate, 4–5 mm; style 1.8–2.4 mm, stellate at base; style branches two, 1(–2) mm; ovary stellate.

Distribution, habitat, and phenology. The only known collection of *Dombeya midongyensis* is from humid forest in southeastern Madagascar; it was in flower in August.

IUCN Red List category. As a distinct species, the preliminary IUCN Red List category (IUCN, 2001) for *Dombeya midongyensis* is Critically Endangered or CR, D. Only one locality is known; it is not known whether the type collection (from 1926) was made in what is now the protected area of Midongy du Sud. Unsuccessful efforts were made by the author to relocate the species in several forests around Midongy du Sud and Befotaka during the apparent flowering season (August) with the assistance of an experienced local ranger. It is, therefore, possible to conclude that if this taxon is still present at all, it is very rare and fewer than 50 mature individuals are likely to exist.

Discussion. It may not be certain that *Dombeya midongyensis* is a distinct species. *Dombeya midongyensis* is known from a single specimen whose indument includes sparse stellate pubescence on the twigs, petioles, and leaves as well as pilose indument on the midribs of most leaves. The lack of additional specimens with similar morphology provides cause for suspicion that the type of *D. midongyensis* might be a hybrid involving *D. decanthera* subsp. *farafanganica*, the only other species with pilose indument confined to the midribs, and some small-leaved species having narrow stipule scars and leaves broadest above the midpoint. The former taxon has been collected from Befotaka, which is in the vicinity of Midongy du Sud. The dual indument on the leaves might also suggest hybridization, though two species of *Dombeya* subg. *Dombeya* from the Mascarenes that are known from multiple collections are reported to have a mixed stellate and sparsely pilose indument (Friedmann, 1987).

4. Dombeya ramiovensis (Arènes) Appleq., comb. et stat. nov. Basionym: *Dombeya farafanganica* Arènes subsp. *ramiovensis* Arènes, Candollea 16: 403. 1958. TYPE: Madagascar. Fianarantsoa: Ramiova, RN V [Andringitra], canton Sendrisoa, distr. Ambalavao, 6 June 1951 (fr.), *Reserves Naturelles 3069* (holotype, P!; isotype, P!).

Shrub or tree to 6 m; twigs grayish to dark grayish brown, the youngest ± fimbriate-lepidote, often reddish, or sparsely papillate, with leaf scars very prominent; stipules caducous, lanceolate to deltoid, 1–4.5 mm, with flat scurfy to fimbriate-scaly indument; stipule scars on young twigs narrow, not prominent. Leaves narrowly elliptical to oblanceolate, sometimes tending toward obovate or lanceolate-elliptical, 3–12 × 1–4.1 cm; petiole 2.5–13 mm, fimbriate-lepidote (often reddish) to glabrate or papillate; base cuneate to rounded; apex acute to short-acuminate with a usually rounded tip or rounded to shallowly emarginate; margins crenulate, especially apically, to subentire, with marginal glands variably located, usually inconspicuous, occasionally projecting slightly; adaxial surface glabrous; abaxial surface glabrous to glabrate with few stellate trichomes, especially when young, or bearing minute reddish papillae; basal veins 3 to 5, the outer weak; secondary veins above the base 4 to 8(to 10) per side, occasionally with subscalariform tertiary venation, visible but inconspicuous on upper surface; domatia present, small with few straight trichomes, basal and/or in axils of lower secondary veins. Inflorescences (1)2- to 7-flowered; peduncle 0.3–2.8 cm, rarely paired in axils; pedicels (1.5–)4–10 mm, shorter or longer than peduncle; peduncle and pedicels fimbriate-lepidote to substellate, sometimes densely so on peduncle and often reddish, or sparsely papillate; bracteoles sometimes persisting beyond anthesis, linear to lanceolate or narrowly deltoid, 0.5–2.5 mm, scaly to glabrous, borne immediately beneath flower. Sepals 2.5–4.4 mm, often reflexed after anthesis, minutely papillate, sometimes with sparse flattened stellate trichomes or scales, to glabrate, or with sparse to moderate scurfy indument; petals 4–5.8 × 1.7–3.1 mm, obovate, asymmetrical; corona 0.4–1.5 mm; stamens 5(to 10); filaments 0.5–1.5 mm, sometimes partly fused above corona; anthers 0.5–1 mm; staminodes linear, 1.5–3.4 mm; style 1–2.4 mm, sometimes deeply divided, glabrous; style branches two, 1–2(–3) mm, sometimes papillate, curled; ovary papillate, occasionally in part sparsely fimbriate-lepidote. Immature fruit subglobose often with remains of style base at apex, to at least 2 mm diam., sometimes shallowly ridged, pale brown, papillate, with style and stigma branches persisting; developing ovules possibly 2, with empty space in ovary before seeds mature.

Distribution, habitat, and phenology. *Dombeya ramiovensis* is native to southeastern Madagascar; it has been reported to occur on marble substrate up to 1342 m. The species flowers in March and April, and immature fruits have been collected in June and September.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya ramiovensis* is noted as Vulnerable or VU, D. Two historical locations are known, so the area of occupancy is likely to be small. One of those localities is unprotected and subject to continued habitat loss, and the species' persistence at the other has not been confirmed by recent collection.

Discussion. Placement of *Dombeya ramiovensis* is difficult. Although this treatment maintains its traditional placement with other long-peduncled southeastern species, several characters suggest a possible relationship to the three very distinctive species of *Dombeya* ser. *Pentandrae*: leaves with domatia in axils of secondary veins, stamens frequently only five, style sometimes deeply divided, and inflated fruits with empty space inside at an early stage of development. Although each of these characters is rare, none is entirely unknown elsewhere in *Dombeya* subg. *Xeropetalum*, and the flowers, with narrow, erect, oppositisepalous staminodes and well-developed corona and filaments, show none of the other derived characteristics of *Dombeya* ser. *Pentandrae*. Domatia bear small clusters of unbranched trichomes, while those of *Dombeya* ser. *Pentandrae* do not. It is, however, possible that this species represents the sister group of that series.

Arènes (1958, 1959) treated *Dombeya ramiovensis*, then known only from the type, as a subspecies of *D. farafanganica*, but it has significant differences from that taxon (herein recognized at the subspecific level within a more broadly circumscribed *D. decanthera*), which has broader, longer-petioled leaves with no domatia, usually pilose midribs and often conspicuous papillae, and broadened prominent stipule scars. The inflorescences and flowers of *D. decanthera* are also somewhat larger. *Dombeya ramiovensis* is much more likely to have close affinities to *D. apikyensis*, another small-flowered southeastern species that shares the probably derived character of narrow stipule scars; that species lacks domatia and has more usually obovate leaves with one basal vein.

Four additional specimens herein included in *Dombeya ramiovensis*, all from Ambatofinandrahana, have much smaller leaves than the type, much smaller stipules, and somewhat smaller inflorescences. The indument is also rather different (inflorescences more or less fimbriate-lepidote vs. sparsely papillate in the type; sepals papillate and often sparsely lepidote to stellate vs. minutely scaly in the type), and stamen number is usually reduced to five rather than 10 as in the type. Since these specimens are from the same region and share the presence of domatia, a rare character in the long-peduncled species, while all of the variable characters enumerated are also seen to vary within certain better collected species, it appears most conservative to treat them all as conspecific. Additional material from Andringitra would be needed to determine definitively whether the two populations should be treated as distinct. One of the collections from Ambatofinandrahana (*Birkinshaw 1318*) has small, probably immature leaves with unusually narrow bases and very few domatia; the ovary sometimes bears a few large apical stellate-lepidote trichomes, a character not seen in any other specimen.

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** 8 km S of Ambatofinandrahana, *Birkinshaw 1318* (MO); Ambatofinandrahana, *Bosser 9834* (P); Ambatofinandrahana, "route de Fenoarivo," *Bosser 9836* (MO); "environs d'Ambatofinandrahana ± 10 km route de Fenoarivo," *Descoings 3239* (MO).

II. Dombeya ser. **Decantherae** (Arènes) Appleq., stat. nov. Basionym: *Dombeya* subsect. *Decantherae* Arènes, Candollea 16: 390. 1958. TYPE: *Dombeya decanthera* Cav.

Dombeya subser. *Lavasoenses* Arènes, Candollea 16: 395. 1958. TYPE: *Dombeya lavasoensis* Arènes.

Young twigs papillate, scurfy to flat-stellate, or pilose; stipule scars relatively broad, usually pale, seldom dark, often prominent, or stipules persistent. Leaves elliptical, broadly elliptical, or ovate (seldom to broadly ovate, narrowly elliptical, or lanceolate) or narrowly lanceolate; basal veins 3 to 5; secondary veins 4 to numerous; domatia absent; petioles pilose, papillate, short-pubescent, scaly stellate, or glabrous. Inflorescences umbellate, small dichotomizing cymes, or 1-flowered, papillate or scurfy to flat-stellate (seldom glabrate) or pilose; peduncles absent or (8–)12–49(–54) mm, usually but not always longer than pedicels. Petals broadly obovate to obovate, strongly or less often moderately asymmetrical, not convex; stamens 10 to 15; staminodes ± oppositisepalous, longer than longest fertile filaments; ovary papillate, flat-stellate, or stellate.

Distribution and habitat. *Dombeya* ser. *Decantherae* is native to southeastern Madagascar and has been reported from habitats that include littoral, humid, and transitional forests at low to moderate altitudes (21–500 m, perhaps rarely to 1000 m).

Discussion. The species included within *Dombeya* ser. *Decantherae* might be related to those of *Dombeya* ser. *Mananarenses*. In two species, *D. decanthera* and *D. lavasoensis*, persistent remnants of the stipule bases are often present, giving stipule scars a broad, raised, pale appearance as is typical of the latter series, though a portion of *D. decanthera* has stipule scars that are elevated by outgrowth of the twig beneath them. Both species have generally elliptical to ovate leaves and unusual pilose indument, on the midrib in *D. decanthera* and throughout in *D. lavasoensis*. *Dombeya lavasoensis* has solitary flowers so cannot be placed into a section by

inflorescence morphology, but (with caveats, noted below) it seems better placed in *Dombeya* sect. *Decastemon* than *Dombeya* sect. *Xeropetalum*. The newly described *D. pilosissma* has small few-flowered dichotomizing cymes; like *D. lavasoensis*, it has long-pilose indument on most organs. This is a very unusual character in *Dombeya*. All three of these species are native to southeastern Madagascar, so it seems probable that they form a natural group.

KEY TO THE SPECIES OF *DOMBEYA* SER. *DECANTHERAE*

1a. Leaves normally pilose on midrib, very rarely glabrous, papillate to glabrous or sparsely stellate on rest of surface; inflorescences umbellate (rarely partly cymose), usually long-peduncled ..... 5. *D. decanthera*

1b. Leaves pilose throughout; inflorescences small dichotomizing cymes or flowers solitary.

2a. Leaves narrowly lanceolate, < 10 cm; flowers solitary; petals < 8 mm, obovate and moderately asymmetrical ... 7. *D. pilosissima*

2b. Leaves ovate to elliptical, < 10 cm; flowers borne at least partly in small cymes; petals > 8 mm, broadly obovate and strongly asymmetrical ..... 6. *D. lavasoensis*

5. Dombeya decanthera Cav., Diss. 3, Tertia Diss. Bot., 126, tab. 40, fig. 2. 1787. *Melhania decanthera* (Cav.) DC., Prodr. [A. P. de Candolle] 1: 499. 1825. TYPE: Madagascar, s.d. (fl.), [*P.*] *Commerson s.n.* (lectotype, designated by Arènes [1958: 406], P!; isolectotypes, C not seen, C image!, MA not seen, MA image!, MPU [2] not seen, MPU [2] images!).

Tree or rarely a large shrub; twigs brown to grayish, the youngest bearing papillae, sometimes reddish and/or scurfy scales, with occasional flat-stellate trichomes; stipules caducous or seldom persistent, lanceolate to deltoid, sometimes acuminate, 0.6–5.5(–12) mm, sparsely scaly, occasionally also stellate; stipule scars frequently prominent, pale or dark, crescent-shaped to hemielliptical. Leaves broadly elliptical to elliptical, ovate, or broadly ovate, less often narrowly elliptical to lanceolate, 4.5–14(–16.5) × (2–)2.5–6.5(–7.5) cm; petiole (0.6–)1.8–3.4(–3.8) cm, glabrous, papillate, pubescent with short straight trichomes, or scaly, seldom with few stellate trichomes; base broadly cuneate to cuneate or rounded or rarely attenuate; apex acuminate to cuspidate or long-apiculate, occasionally acute, rounded, or emarginate; margins shallowly wavy to crenate or crenate-dentate, seldom subentire or with few serrate teeth apically, with marginal glands inconspicuous, sometimes absent, located in marginal concavities or near tooth apices; adaxial surface glabrous or papillate; abaxial surface normally pilose on midrib, very rarely glabrous, elsewhere inconspicuously flat-papillate, sometimes with reddish papillae, or glabrous, occasionally with few small stellate trichomes; basal veins (3 to)5, if 5 the outer weak; secondary veins above the base 4 to 9(to 11) per side, visible but inconspicuous on adaxial surface; domatia absent. Inflorescences 3- to 15(to 21)-flowered; peduncle (0.8–)1.4–4.9(–5.4) cm or rarely absent or once-branched as an aberration, normally but not always longer than pedicels; pedicels (4–)5.5–18(–21) mm; peduncle and pedicels papillate, sometimes with dark or reddish papillae, and/or with a sparse indument of small scurfy to flat-stellate scales, less often glabrate; bracteoles sometimes persisting beyond anthesis, 0.6–3.1 mm, varying from linear, narrowly oblong, lanceolate, or spatulate to ovate or broadly elliptical, papillate and/or scaly, borne immediately beneath flower. Sepals (2.8–)3.5–6(–6.8) mm, usually reflexed after anthesis, with indument of small or flat-stellate trichomes or scales and sometimes papillae; petals white, (4.9–)6–9.5 × (2.8–)3.2–6.5(–7) mm, obovate to broadly obovate, usually strongly asymmetrical especially when relatively narrow; corona 0.7–1.8 mm, narrowed above ovary; stamens 10(to 15); filaments 0.5–1.6(–2.5) mm, sometimes partly fused above corona; anthers orange to yellow, 0.5–1(–1.3) mm; staminodes linear, 2.3–5(–5.5) mm; style (0.8–)1.5–3.5(–4) mm, rarely deeply divided, the basal portion papillate and/or pubescent or stellate, or rarely glabrous; style branches 2(3), (0.8–)1.5–3 mm, papillate or bearing indument like that of style, usually curled; ovary papillate, sometimes with a few larger semi-stellate scales or apical stellate trichomes. Fruit (known only from *Dombeya decanthera* subsp. *farafanganica* (Arènes) Appleq.) broadly elliptical, to 3 mm high, 2.4 mm diam., with persistent style base, pale, papillate; only 1 seed per fruit maturing, broadly ellipsoid, 2.5 mm, pale brown with minutely textured surface, 2 distinct grooves on one side.

Discussion. *Dombeya farafanganica* is herein treated as two subspecies of *D. decanthera*, as both encompass enough morphological variability that it is not possible to define a suite of fixed characters that separate them at the species level. While *D. decanthera* is widespread and found in a variety of habitats, the three subspecies recognized have more limited ecological ranges.

Several sheets of *Dombeya decanthera* collected by Commerson exist; none have dates or locality data. Though the P specimen is somewhat atypical of the group of populations around the city of Tôlanaro (Fort Dauphin) herein treated as *D. decanthera* subsp.

decanthera, that does seem on morphological grounds to be its most likely affinity. Two sheets held by MPU, which have not been seen by this author but whose images are available on JSTOR (<www.jstor.org>), have been presumed to be type material. The larger and more mature of these has more strongly toothed margins than the specimen at P, so bears a stronger resemblance to *D. decanthera* subsp. *latifolia* (Arènes) Appleq., though its stipules are short. The slightly different appearance may indicate that the MPU specimens are of a different individual, potentially collected at a different time or place than the P specimen; however, intraindividual variation can be significant.

KEY TO THE SUBSPECIES OF *DOMBEYA DECANTHERA*

1a. Leaf margins usually crenate-dentate with prominent teeth, glands variably placed but usually near tooth apices; inflorescences 3- to 5(to 9)-flowered; littoral forests along southeastern coast ..... 5c. subsp. *latipetala* (Arènes) Appleq.

1b. Leaf margins shallowly wavy to crenate or crenate-dentate, glands variably placed, often located between teeth; inflorescences (3- to)5- to 15(to 21)-flowered; humid and transitional forests.

2a. Leaves variable in shape, 4.5–9.5(–12) × 1.7–5(–5.9) cm; petiole 0.6–2.3(–3.2) cm, papillate or scaly, sometimes sparsely stellate or pilose near leaf base; style (0.8–)1.5–2.5 mm, the lower half usually bearing straight and/or stellate trichomes, rarely papillate or glabrous; extreme southeastern Madagascar ..... 5a. subsp. *decanthera*

2b. Leaves broadly elliptical to elliptical, (7–)8–14(–16.5) × (3.4–)4–6.5(–7.5) cm; petiole (1.5–)1.8–3.4(–3.8) cm, glabrous or pubescent; style (2.2–)2.5–3.5 mm, the basal portion papillate sometimes with a few short trichomes or flattened-stellate scales; eastern Madagascar ..... 5b. subsp. *farafanganica*

5a. **Dombeya decanthera** Cav. subsp. **decanthera**

Dombeya decanthera subsp. *decanthera* var. *bojeriana* (Baill.) Arènes, Candollea 16: 406. 1958, syn. nov. Basionym: *Dombeya bojeriana* Baill., Bull. Mens. Soc. Linn. Paris 1: 495. 1885. TYPE: Madagascar, s.d. (fl.), [*W.*] *Bojer s.n.* (holotype, P!).

Dombeya decanthera subsp. *meridionalis* Arènes, Candollea 16: 406. 1958, syn. nov. TYPE: Madagascar. Toliara: mont Ankazovandamena, près de la baie des Galions (Ranofotsy) au SW de Fort Dauphin, forêt ombrophile sur gneiss, rochers du sommet, 100–450 m, 21 Feb. 1955 (fl.), *H. Humbert & R. Capuron 29082* (holotype, P!; isotype, P!).

Tree to 10 m, 10 cm diam., or shrub to 5 m; young twigs bearing small white or reddish flat papillae or scurfy scales and occasionally a few flat-stellate trichomes; stipules caducous or persistent, lanceolate to deltoid and sometimes acuminate, 0.6–1.5(–2.5) mm, sparsely scaly and stellate; stipule scars on young twigs moderately prominent or not, pale, irregular, hemielliptical but small. Leaves broadly elliptical to broadly ovate, ovate, narrowly elliptical, or lanceolate, 4.5–9.5(–12) × 1.7–5(–5.9) cm; petiole 0.6–2.3(–3) cm, papillate or scaly, sometimes sparsely stellate or pilose near leaf base; base rounded to broadly cuneate, rarely attenuate; apex short-acuminate to long-acuminate, cuspidate, acute with a rounded tip, or rounded; margins shallowly wavy to crenate or crenate-dentate, with glands variably located, sometimes projecting slightly; adaxial surface papillate to glabrous, abaxial surface pilose only along midrib, at least basally, or very rarely glabrous, elsewhere papillate to glabrous, rarely with few small stellate trichomes; secondary veins above the base 4 to 7 per side. Inflorescences (3- to)5- to 15(to 21)-flowered; pedicels 5.5–14 mm; peduncle and pedicels papillate and often bearing a few flat-stellate trichomes; bracteoles sparsely papillate and often scaly stellate. Sepals (2.8–)3.5–5(–5.5) mm, almost always reflexed, with indument of papillae and small flat-stellate trichomes or scales; petals (4.9–)6–8(–9) × (2.8–)3.2–6 mm; corona 0.7–1.1 mm, occasionally narrowed above ovary; anthers 0.5–0.9 mm; style (0.8–)1.5–2.5 mm, occasionally deeply divided, at least the lower half usually short-pilose and/or stellate, rarely papillate or glabrous; style branches (0.8–)1.7–2.5 mm, papillate or sometimes bearing indument similar to that of style; ovary papillate and sometimes bearing stellate trichomes on apical portion. Fruit unknown.

Distribution, habitat, and phenology. *Dombeya decanthera* subsp. *decanthera* is native only to a small region around Tôlanaro (Fort Dauphin) and Andohahela National Park in extreme southeastern Madagascar. It is reported from humid and transitional forests, on thin soil and gneiss, at elevations from 25 to at least 500 m (and perhaps occasionally to 1000 m). Flowering specimens have been collected from December through July; immature fruits have been collected in December.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya decanthera* subsp. *decanthera* is noted as Vulnerable or VU, D. Though it occurs in part on protected land, probably only five distinct populations are known, all in a small geographic area so that either natural events or human activity might affect all populations simultaneously.

Vernacular names. Hafopotsy (*Rabenantoandro et al. 112*), mandoavato (*Randriamampionona 835*),

sely (*Reserves Naturelles 13055*), tanafotsy [?] (*Service Forestier 26053*).

Discussion. Though *Dombeya decanthera* subsp. *decanthera* has a limited geographic range, considerable morphological variation can be observed. Included is one aberrant collection, *Randriamampionona 835*, most of the duplicates of which are near-glabrous and lack the midrib trichomes that normally make this species easy to recognize. Also notably, *Service Forestier 28576* has small obovate to elliptical leaves with three basal veins, which at first glance resemble those of *D. apikyensis* and similar species, small and only slightly broadened stipule scars, and small flowers. However, the leaves sometimes have a few long straight trichomes at the base of the midrib; the bracteoles are small and sometimes persistent; the corona often narrows at the top of the ovary then reflexes outward; and the style bears sparse short white trichomes, while the ovary is papillate. This specimen is suggested to be a hybrid involving *D. decanthera* subsp. *decanthera*, which could contribute all four of those unusual characters, and a smaller-leaved species such as *D. apikyensis*, *D. australis*, or *D. ranofotsyensis* Arènes, the last of which is known from Ranopiso.

Additional specimens examined. MADAGASCAR. **Toliara:** Mihana, Fort Dauphin, *Birkinshaw et al. 449* (P); Mandena, Fort Dauphin, s.d., *M. G. Johnson s.n.* (P); Ambatorongorongo, Amboavola, Fort Dauphin, *Rabenantoandro et al. 112* (P); Andohahela, parcelle 1, *Randriamampionona 420* (MO, P); Andohahela, parcelle 1, *Randriamampionona 433* (MO, P); Andohahela, parcelle 1, *Randriamampionona 835* (MO); Anosy, [Ambatorongorongo], *Razakamalala et al. 4271* (MO); Andohahela, parcelle 1, *Reserves Naturelles 9440* (P); Fort Dauphin, *Reserves Naturelles 13055* (P); Andohahela, *Service Forestier 26053* (P).

Probable hybrid specimen. MADAGASCAR. **Toliara:** Vohitsiandriana, *Service Forestier 28576* (P [4]).

5b. Dombeya decanthera Cav. subsp. **farafanganica** (Arènes) Appleq., comb. nov. Basionym: *Dombeya farafanganica* Arènes subsp. *farafanganica*, Candollea 16: 401–402. 1958. TYPE: Madagascar. Fianarantsoa: Befotaka, province de Farafangana, 12 Aug. 1926 (fl.), *R. Decary 4784* (holotype, P!; isotype, P!).

Dombeya farafanganica [subsp. *endrina* Arènes var. *endrina*] subvar. *endrina*, Candollea 16: 403–404. 1958, syn. nov. TYPE: Madagascar. Toamasina: RN I, canton Ambodiriana, distr. Tamatave, 23 July 1953, *Reserves Naturelles 5920* (holotype, P!; isotypes, P!, TEF not seen, TEF image!).

Dombeya farafanganica [subsp. *endrina*] var. *linearis* Arènes, Candollea 16: 404. 1958, syn. nov. TYPE: Madagascar. Fianarantsoa: Befotaka, prov. de Farafangana, 11 Aug. 1926 (fl.), *R. Decary 4729* (holotype, P!; isotypes, P!, PRE not seen, PRE image!).

Dombeya farafanganica [subsp. *farafanganica*] var. *manakensis* Arènes, Candollea 16: 403. 1958, syn. nov. TYPE: Madagascar. Toamasina: RN 3, canton Manaka Est, distr. Ambatondrazaka, bas fond, 4 Sep. 1951 (fl.), *Reserves Naturelles 3145* (holotype, P!; isotypes, P!, TAN not seen, TAN image!).

Dombeya manaharica Baill., Bull. Mens. Soc. Linn. Paris 1: 491–492. 1885, syn. nov. TYPE: Madagascar. Toamasina: Manahar, s.d. (fl.), [*J.-H. L.*] *Humblot 244* (holotype, P!; isotypes, G not seen, G image!, K not seen, K image!, P [2]!).

Tree to 30 m; young twigs bearing scurfy scales; stipules caducous, lanceolate, often long-acuminate, 4–5 mm, sparsely scaly; stipule scars on young twigs prominent or not, pale or seldom dark, crescent-shaped to hemielliptical. Leaves broadly elliptical to elliptical, (7–)8–14(–16.5) × (3.4–)4–6.5(–7.5) cm; petiole (1.5–)1.8–3.4(–3.8) cm, glabrous or pubescent; base broadly cuneate to rounded; apex short-acuminate to cuspidate or long-apiculate, or rarely in individual leaves rounded or emarginate; margins shallowly wavy to crenate with few long shallow rounded teeth or subentire especially when young, occasionally with few serrate teeth apically, with glands inconspicuous or lacking, often located in marginal concavities; adaxial surface glabrous; abaxial surface pilose only along midrib, elsewhere usually inconspicuously flat-papillate; secondary veins above the base 6 to 8 per side. Inflorescences (5)6- to 15-flowered; pedicels (4–)7–14.5 mm; peduncle and pedicels with a sparse indument of small scurfy to flat-stellate scales and/or papillae or glabrate; bracteoles scaly. Sepals (3.5–)4–5.5 mm, usually but not consistently reflexed, with indument of small stellate trichomes or scales; petals 7–8.6(–9) × (3–)3.5–5.5(–7) mm; corona 1.2–1.8 mm, not narrowed above ovary; anthers (0.5–)0.8–1 mm; style (2.2–)2.5–3.5 mm, the lower portion papillate sometimes with a few short straight trichomes or flattened-stellate scales; style branches (1.5–)2–3 mm, papillate; ovary white post-anthesis, papillate, sometimes with a few larger semi-stellate scales. Fruit broadly elliptical, to 3 mm high, 2.4 mm diam., with persistent style base, pale, papillate; 1 seed per fruit maturing, broadly ellipsoid, ca. 2.5 mm, pale brown with minutely textured surface, 2 distinct grooves on one side.

Distribution, habitat, and phenology. *Dombeya decanthera* subsp. *farafanganica* is found in humid forests of eastern Madagascar at recorded elevations of 250–500 m. It flowers from July to September; mature fruit has been collected in September.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya decanthera* subsp. *farafanganica* is noted as Vulnerable or VU B2ab(iii) due to the small number of populations and ongoing destruction of habitat, although it does occur in two protected areas.

Vernacular names. Hafobalo (*Reserves Naturelles 9180*, *Service Forestier 18110*), hafotra (*Reserves Naturelles 3145*), hafotra endrina (*Reserves Naturelles 5920*).

Discussion. *Dombeya decanthera* subsp. *farafanganica* is differentiated from *D. decanthera* subsp. *decanthera* primarily by its larger leaves (to 14[–16.5] cm vs. 9.5[–12] cm) and a different indument, especially on the petiole and style; the corona is never narrowed above the ovary. It has a broader and more northern distributional range. Unfortunately, despite the name, this subspecies does not occur in the vicinity of Farafangana, being found farther inland and at higher altitudes (up to 500 m); collections made near Farafangana are of *D. decanthera* subsp. *latipetala*.

Dombeya farafanganica was described at the species level by Arènes (1958, 1959), who further segregated one specimen as *D. manaharica* because its ovary and style were stellate rather than papillate. The ovaries of the type specimen of *D. manaharica* are largely papillate with limited coverage by flattened stellate trichomes, although one flower in the fragment packet does have relatively dense stellate trichomes. Most styles bear flattened stellate trichomes, and small unbranched trichomes, more densely than is typical of *D. decanthera* subsp. *farafanganica*. This represents, however, an extreme version of the variation in indument already seen in *D. decanthera* subsp. *farafanganica* rather than an entirely novel condition, and the collection is otherwise representative. Most varieties and subvarieties recognized by Arènes are based on highly variable characters and are not useful.

The bark is stated to have presumably useful fiber (*Reserves Naturelles 3145*).

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** Befotaka, Farafangana, *Decary 4729* (P [2]). **Toamasina:** Ambatondrazaka, Bemoasa, *Rakotonandrasana et al. 542* (P); Zahamena, NW of Andratanantsoitra, *Randrianjanaka & Zafy 169* (P); Vohimangitra, canton Ambodiriana, *Reserves Naturelles 9180* (P); Réserve Naturelle Betampona, Ambodiriana, *Service Forestier 18110* (MO, P [2]).

5c. Dombeya decanthera Cav. subsp. **latipetala** (Arènes) Appleq., comb. et stat. nov. Basionym: *Dombeya farafanganica* Arènes [subsp. *endrina* var. *endrina*] subvar. *latipetala* Arènes, Candollea 16: 404. 1958. TYPE: Madagascar. Fianarantsoa: Boma (distr. de Farafangana), 13 Sep. 1954 (fl.), *Service Forestier 12391* (holotype, P!; isotypes, P!, TEF not seen, TEF image!).

Tree to 15 m, 0.5 m diam.; young twigs bearing papillae and usually scurfy scales; stipules caducous or rarely persistent, lanceolate, sometimes long-acuminate, (2.5–)3.5–5.5(–12) mm, sparsely scaly; stipule scars often strongly prominent, pale, irregularly crescent-shaped to hemielliptical. Leaves elliptical to ovate or broadly elliptical, (7–)8–14(–16.5) × (3.2–)4–7(–9) cm; petiole (0.7–)1.4–3(–3.7) cm, usually papillate, sometimes pubescent; base rounded or occasionally cuneate; apex short-acuminate to cuspidate or long-apiculate; margins crenate-dentate, with teeth usually prominent and well defined, with glands inconspicuous but usually present, usually near teeth apices; adaxial surface glabrous; abaxial surface pilose only along midrib, elsewhere flat-papillate with sometimes reddish papillae; secondary veins above the base (4 to)6 to 9(to 11) per side. Inflorescences 3- to 5(to 9)-flowered; pedicels 7–18(–21) mm; peduncle and pedicels papillate, often with reddish or dark papillae, and usually with sparse small scurfy to flat-stellate scales; bracteoles scaly. Sepals (4–)5–6(–6.8) mm, usually reflexed at least after anthesis, occasionally not, bearing small stellate trichomes or scales; petals 6.5–9.5 × (3.8–)4.5–6.5 mm; corona 1–1.5 mm, not narrowed above ovary; anthers 0.8–1.1(–1.3) mm; style 1.5–3(–4) mm, the lower portion papillate and sometimes bearing a few short trichomes; style branches (1.2–)1.5–2.5 mm, papillate; ovary densely papillate, possibly becoming more sparsely papillate post-anthesis. Fruit not seen.

Distribution, habitat, and phenology. *Dombeya decanthera* subsp. *latipetala* is native to littoral forests of southeastern Madagascar; it has been reported to occur on basalt and from elevations of 21–72 m. It flowers in August through October; immature fruit has been collected in September.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya decanthera* subsp. *latipetala* is noted as Vulnerable or VU, D. This subspecies does occur in a protected area, but there may be as few as five distinct populations, all relatively close geographically and, therefore, vulnerable to stochastic events.

Vernacular name. Hafotra [à petites feuilles] (*Service Forestier 12391*).

Discussion. *Dombeya decanthera* subsp. *latipetala* differs from *D. decanthera* subsp. *farafanganica* in that the leaves are frequently ovate, the marginal teeth are usually well defined and conspicuous, and secondary veins usually run to tooth apices; the inflorescence has fewer flowers on average, and the flower may be on average somewhat larger, with more consistently broad petals. *Applequist et al. 249* is identified as a probable hybrid between *D. decanthera* subsp. *latipetala* and *D. australis* subsp. *grandiflora*, both of which occur at Manombo. It has relatively large, broadly elliptical leaves but is virtually glabrous throughout, the latter state typical of *D. australis*.

The wood is used for poles and posts (*Service Forestier 16200*).

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** Atsimo-Atsinanana, Vohipaho, *Andriamihajarivo et al. 1683* (MO); Atsimo-Atsinanana, Vohipaho, *Andriamihajarivo et al. 1736* (MO); Atsimo-Atsinanana, Vohipaho, *Applequist et al. 255* (MO, P, TAN, US), *Applequist et al. 257* (MO, P, TAN, US); Atsimo-Atsinanana, Manombo, *Applequist et al. 263* (MO, P, TAN, US); Atsimo-Antsinanana, Manombo, *Rabarimanarivo et al. 65* (P); Manombo, *Rakotonirina et al. 277* (MO); Marimpananihy, Farafangana, *Service Forestier 16200* (MO, P); Manombo, Farafangana, *Service Forestier 23652* (MO, P).

Probable hybrid specimen. MADAGASCAR. **Fianarantsoa:** Farafangana, Manombo, *Applequist et al. 249* (MO, P, TAN, US).

6. Dombeya lavasoensis Arènes, Candollea 16: 395–396. 1958. TYPE: Madagascar. Toliara: forêts ombrophiles du massif du Lavasoa (au N de la baie des Galions), vers 150 m, Feb. 1955 (fl., fr.), *Service Forestier 11821* (holotype, P!; isotypes, P [2]!, TAN not seen, TAN image!).

Shrubs; twigs dark to very pale grayish brown, the youngest pilose with long (0.5–1 mm) white trichomes; stipules relatively persistent, very narrowly deltoid, 1–4 mm, sparsely pilose; stipule scars on young twigs crescent-shaped to hemielliptical, not prominent or conspicuously colored. Leaves elliptical to ovate, 3–6.7 × 1.7–3.5 cm; petiole 5–10(–15) mm, pilose; base rounded, often slightly asymmetrical to very shallowly cordate; apex acute; margins irregularly denticulate to serrulate or crenulate, glands apparently absent; both surfaces pilose, with occasional stellate trichomes; basal veins 5; secondary veins above base 5 to 7 per side, sometimes approaching craspedodromous, inconspicuous on adaxial surface; domatia absent. Flowers solitary, axillary near ends of branches, few in number; pedicels (8–)10–24 mm, possibly elongating in fruit, pilose; bracteoles frequently persistent past anthesis, lanceolate or narrowly deltoid, 2–4 mm, sparsely pilose, 2 borne close beneath flower with one often slightly lower. Sepals 6–7 mm, not reflexed, pilose, persistent in fruit; petals white, 8–9.5(–11) × 7–8(–9) mm, broadly obovate, prominently asymmetrical; corona 1.5–1.8 mm; stamens 15; filaments 1–2.5 mm; anthers 0.7–0.9 mm; staminodes narrowly spatulate, 4.3–4.7(–5.5) mm; style 5.5–6 mm; branches 3, 1.5–2 mm; ovary densely pubescent with large flattened stellate trichomes. Fruit pale to dark brown, shallowly lobed, 5–6 mm high, 7–10 mm diam., with few persistent stellate trichomes; seeds at least 2 per locule, suborbicular, 3–3.5 mm, reddish brown, mottled.

Distribution, habitat, and phenology. *Dombeya lavasoensis* has been collected from forests near the summits of granite massifs in extreme southeastern Madagascar; the only recorded altitude is 150 m. It flowers and fruits from December to February; mature or nearly mature fruits may be found on flowering branches.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya lavasoensis* is noted as Endangered or EN B1ab(iii)+2ab(iii). Only two localities are known; neither are protected and both are, therefore, subject to habitat degradation, and no recent collections have been made.

Discussion. *Dombeya lavasoensis* may be closely related to *D. decanthera*; they share elliptical to ovate leaves and varying degrees of pilose pubescence. However, the leaf marginal glands of *D. lavasoensis* are either extremely inconspicuous or entirely absent, and up to six seeds per fruit may mature. Neither condition is usual in *Dombeya* sect. *Decastemon*, though the fruits of many species are unknown. Its placement in this series, and even in this section, may be questionable; solitary flowers could have been derived from either an umbellate or a cymose inflorescence, though no species in *Dombeya* sect. *Xeropetalum* are particularly reminiscent of *D. lavasoensis*.

Additional specimen examined. MADAGASCAR. **Toliara:** massif of Vohitsiandriana, Ranopiso, *Service Forestier 28572* (P).

7. Dombeya pilosissima Appleq. & T. Andriam. TYPE: Madagascar. Atsimo-Atsinanana: Vangaindrano, Sianofana, Ambatomalama, forêt de Vohipa[h]o, 23°26′42″S, 047°30′57″E, 76 m, 22 Sep. 2009 (fl), *Razanatsima & Andriamihajarivo 776* (holotype, MO!; isotypes, P!, TAN not seen). Figure 1.

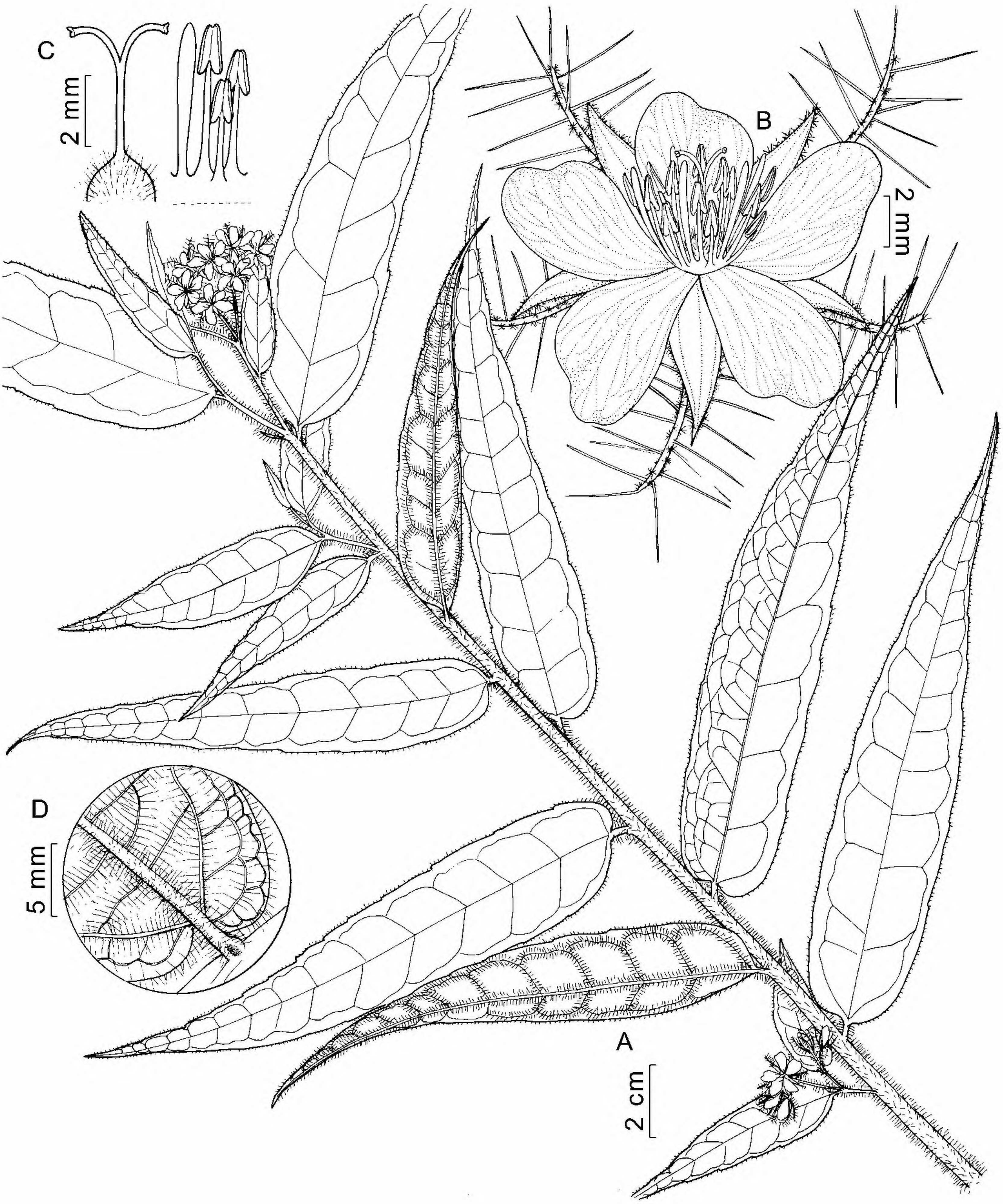


Figure 1. *Dombeya pilosissima* Appleq. & Bosser. —A. Habit. —B. Flower. —C. Gynoecium. —D. Abaxial leaf surface. A–D from *Razanatsima & Andriamihajarivo 776* (MO).

Diagnosis. Distinguished from *Dombeya lavasoensis* Arènes by narrowly lanceolate leaves, 13–16.5 cm long with shorter (4–5 mm) petioles and secondary veins 10 or more per side, very prominent beneath, inflorescences small, few-flowered cymes, flowers smaller (sepals 4–5 mm, petals 5–6.5 mm, corona 0.5 mm, style 1.5–3 mm) with sepals acuminate, petals narrower and less strongly asymmetrical.

Small tree to 3 m; twigs tan, the youngest pilose with very long (2.5 mm) white trichomes; stipules persistent, linear, 5.5–9 mm, pilose; stipule scars not seen. Leaves narrowly lanceolate, 13–16.5 × 2.3–3.5 cm; petiole 4–5 mm, pilose; base moderately oblique; apex narrowly acute; margins shallowly denticulate-crenulate, glands apparently absent; both surfaces long-pilose, with trichomes borne along veins includ-

ing tertiary and smaller veins; basal veins 5; secondary veins above base 10 or more per side, inconspicuous on adaxial surface, very prominent on abaxial surface; domatia absent. Flowers borne in small 2- to 10-flowered dichotomizing cymes 2.1–6 cm long; peduncle 1.2–2 cm, pilose; pedicels ca. 3–6 mm, pilose; bracts linear, 2.5–4 mm, pilose; bracteoles persistent, linear, 4.5–6 mm, pilose. Sepals 4–5 mm with acuminate apices, partly reflexed, stellate, pinkish; petals white, 5–6.5 × 3.2–3.5 mm, obovate, moderately asymmetrical; corona 0.5 mm; stamens 15; filaments 1.2–2 mm; anthers 0.7–1.1 mm, yellow; staminodes narrowly spatulate, 3–4.5 mm; style 1.5–3 mm; branches two, 0.8–1.3 mm; ovary densely stellate-pubescent. Fruit unknown.

Distribution, habitat, and phenology. *Dombeya pilosissima* has been collected in the sublittoral humid forest of Vohipaho [also called Vohipeno] in southeastern Madagascar at a recorded altitude of 76 m. The type specimen was flowering in September.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya pilosissima* is noted as Endangered or EN B1ab(iii)+2ab(iii). There has been significant collection in remaining low-altitude forests in the region, so the fact that no other specimens of this very distinctive species are known indicates that it is geographically restricted and probably quite rare. Its habitat is under threat from human activity.

Etymology. *Dombeya pilosissima* is named for the very unusual dense, long-pilose indument on most organs, comparable in *Dombeya* subg. *Xeropetalum* only to that of *D. lavasoensis*. Tefy Andriamihajarivo (MO–Madagascar), one of the collectors of the type specimen, first determined this as a probable new species and hence shares authorship of the name.

III. Dombeya ser. **Mananarenses** Arènes, Candollea 16: 391. 1958. TYPE: *Dombeya mananarensis* Arènes. *Dombeya* subser. *Australes* Arènes, Candollea 16: 391. 1958. TYPE: *Dombeya australis* Scott-Elliot.

Dombeya ser. *Lepidotae* Arènes, Candollea 16: 390. 1958. TYPE: *Dombeya capuroniana* Arènes.

Young twigs glabrous, stellate, fimbriate-lepidote, scurfy, or pubescent; stipule scars hemielliptical to irregularly crescent-shaped or flattened deltoid, usually large, pale and at least slightly prominent, seldom small and not elevated. Leaves narrowly elliptical to oblong-elliptical or oblanceolate, less often to narrowly oblong, narrowly oblanceolate, oblong-oblanceolate, or obovate, or seldom tending to lanceolate; basal veins 1 to 5(to 7); secondary veins numerous or (4 to)6 to 10; domatia absent; petioles stellate to fimbriate-lepidote, glabrous, or slightly pubescent. Inflorescences umbellate, occasionally partly cymose or 1-flowered, stellate to scaly, fimbriate-lepidote, glabrate, or (in *D. mandenensis*) flocculent; peduncles (1.5–)7–50(–80) mm or rarely absent, usually longer than pedicels unless both are quite short. Petals broadly obovate to obovate or suborbicular, somewhat asymmetrical, not convex; stamens 10 to 15; staminodes ± oppositisepalous, longer than longest fertile filaments; ovary stellate to lepidote, rarely papillate.

Distribution and habitat. *Dombeya* ser. *Mananarenses* is mostly native to southeastern Madagascar, with one species each in Toamasina (*D. mangorensis*) and the extreme north (*D. capuroniana*). Littoral forest is the most common habitat, but some species occur in humid forests, transitional or dry forests, and bush or thickets; altitudes range from sea level to 1250 m.

Discussion. Six of the seven species included in *Dombeya* ser. *Mananarenses* are likely to form a natural group, as they share a very similar leaf morphology and a mostly southeastern distribution in Madagascar. Stipule scars on young twigs are broad, pale, and sometimes large and conspicuous, a feature widely distributed in the genus but developed to an extreme in some species of this series. *Dombeya capuroniana* is an outlier within the series, as it has a distinctly different leaf shape and is endemic to the extreme northern site of Montagne d'Ambre. It is placed in this series because its small but broad stipule scars and narrow leaves often broadest near the apex cause it to fit better here than in any other series as herein circumscribed. Arènes (1958) segregated *D. capuroniana* as the sole species within *Dombeya* ser. *Lepidotae* because the ovary is lepidote. However, given that indument is so variable in this group, this is a weak basis for description of series. The inclusion of *D. capuroniana* within *Dombeya* ser. *Mananarenses*, therefore, is done here for taxonomic convenience. *Dombeya* ser. *Mananarenses* is preferred as the name for the series because *D. capuroniana* is the least typical included species and because the name *Lepidotae* could be quite misleading, as most species are in no way lepidote.

KEY TO THE SPECIES OF *DOMBEYA* SER. *MANANARENSES*

1a. Twigs and petioles densely fimbriate-lepidote; basal leaf veins 1 ..... 9. *D. capuroniana*
1b. Twigs and petioles glabrous, stellate, or scurfy, seldom sparsely short-pubescent; basal leaf veins 3 to 5(to 7).
2a. Stipules persistent at twig apices; peduncle usually not much longer than pedicels (to [–14] mm) ..... 14. *D. rariflora*
2b. Stipules mostly caducous, though not always rapidly; peduncle usually longer than pedicels (rarely absent).
3a. Stipule scars on young twigs irregularly crescent-shaped to transversely obdeltoid, large and very conspicuous; leaves (8.5–)11–25 cm; pedicels stellate and often flocculent; endemic to Mandena ..... 11. *D. mandenensis*
3b. Stipule scars on young twigs broadly hemielliptical to irregularly crescent-shaped, moderately sized and often not conspicuous; leaves to 12 cm; pedicels glabrate to stellate or sparsely scaly, not flocculent.
4a. Twigs short-pubescent; basal leaf veins (3 to)5 to 7; petals 13–15 mm, filaments 2–4 mm, staminodes 5–7 mm; humid forest in Toamasina ..... 12. *D. mangorensis*
4b. Twigs stellate or glabrous; basal leaf veins 3 or 3 to 5; flowers variable in size, seldom with petals to 14 mm or staminodes to 6 mm, but filaments < 2 mm; southeastern Madagascar.
5a. Petioles reddish stellate; abaxial leaf surface sparsely stellate and minutely papillate to glabrate; basal veins 5 or 3; Mananara River basin ..... 10. *D. mananarensis*
5b. Petioles whitish stellate to glabrate; abaxial leaf surface sparsely stellate to glabrous, not papillate; basal veins 3.
6a. Young twigs glabrous; leaves 4–11.7 cm; peduncle (2.0–)3.5–5.5(–7.0) cm; bracteoles sometimes persistent; developing fruit subglobose, sparsely stellate ..... 8. *D. australis*
6b. Young twigs short-stellate; leaves 3.5–7 cm; peduncle 0.7–2.5(–3.5) cm (or absent); bracteoles caducous; developing fruit cylindrical, sometimes becoming papillate ..... 11. *D. ranofotsyensis*

8. Dombeya australis Scott-Elliot, J. Linn. Soc., Bot. 29: 8. 1891. TYPE: Madagascar. Toliara: woods, Fort Dauphin, Apr. (fl.), *Scott Elliot 2524* [*2668*] (holotype, K not seen, K image!; isotype, P!).

Tree to 8(–12) m tall, 10 cm diam., or large shrub; twigs grayish brown, the youngest dark brown, glabrous; stipules caducous or very rarely persistent, narrowly lanceolate, 2.5–6.5 mm, glabrous or glabrate; stipule scars on young twigs prominent, pale, roughly broadly hemielliptical. Leaves oblanceolate to narrowly elliptical or elliptical or rarely obovate, 4–11.7 × (1–)1.5–4(–4.7) cm; petiole 4–12(–22) mm, glabrous or glabrate with rare small stellate trichomes; base cuneate; apex cuspidate, acute, rounded, or short-acuminate; margins serrulate or rarely conspicuously serrate or crenulate, with glands located in tooth apices or marginal protrusions; youngest leaves sparsely stellate, mature leaves glabrous or glabrate; basal veins 3, the lateral weak; secondary veins above the base 6 to 10 per side or numerous, inconspicuous on adaxial surface; domatia absent. Inflorescences (1)2- to 6(7)-flowered; peduncle (2–)3.5–5.5(–7) cm, glabrous; pedicels 0.9–2.2(–2.7) cm, glabrous, or rarely with 1 to a few small scales on the pedicel and upper peduncle; bracteoles persisting in bud and sometimes into full flower, narrowly lanceolate to ovate, 2.5–4 mm, glabrate with rare small, stellate trichomes or glabrous, immediately beneath flower. Sepals 5.5–8(–9.5) mm, usually but not consistently reflexed, glabrate with very few small stellate trichomes; petals white, (6.5–)8–11(–12) × (4.5–)6–9(–10) mm, broadly obovate, usually ± asymmetrical, sometimes shallowly cleft; corona (0.5–)0.7–1.3 mm; stamens (10 to)15; filaments 0.5–1.5 mm; anthers 0.8–1.4 mm; staminodes linear, (3–)3.5–5(–6) mm; style 2–4(–5) mm, stellate on lower portion; style branches two, (1–)1.5–2.5(–3) mm, thick and flattened, if long then strongly curled; ovary stellate. Immature fruit subglobose, to at least 3.5 mm diam., dark brown, sparsely stellate; mature fruit not seen.

Discussion. Arènes (1958) recognized three subspecies within *Dombeya australis*, of which two are maintained; however, *D. australis* subsp. *geayi* (Hochr.) Arènes is not distinct from *D. australis* subsp. *australis*. The species' range extends from the extreme southeast, near Fort Dauphin, to points farther north around Farafangana. Populations from the northern portion of the range (*D. australis* subsp. *grandiflora*) have, on average, larger flowers but fewer flowers per inflorescence. Though both subspecies frequent littoral forests, they may have somewhat different ecological and substrate preferences. The type of *D. australis*, collected near Tôlanaro, has a young and damaged inflorescence but can be seen to have a 4-flowered inflorescence and a short style, with both features typical of the southern populations.

Original material for *Dombeya australis* was said by Hochreutiner (1926) to include the collections *Scott Elliot 2668* and *2524*, leading to confusion. The holotype at K was originally numbered *2524* but

later annotated "= *2668*." The protologue of *D. australis* cited only the number *2668* (providing additional evidence that the K specimen was used to prepare the publication), but the collection is more appropriately referred to as *2524*, the only number that appears on the P duplicate. Arènes (1958) described *2524* (K) as the lectotype, though he provided no indication that he thought any other original material had existed; this typification is superfluous.

KEY TO THE SUBSPECIES OF *DOMBEYA AUSTRALIS*

1a. Inflorescences (1- to)3- to 6(7)-flowered; sepals 5.5–6.3(–7.5) mm; petals 6.5–10.5 mm; style 2–2.8 mm; littoral and low humid forests of extreme southeast near Fort Dauphin .... 8a. subsp. *australis*

1b. Inflorescences 1- to 3(4)-flowered; sepals 6.5–8(–9.5) mm; petals (7–)8–12 mm; style 2.5–4.5(–5) mm; littoral forests along southeastern coast ..... 8b. subsp. *grandiflora*

8a. Dombeya australis Scott-Elliot subsp. **australis.**

Dombeya australis subsp. *geayi* (Hochr.) Arènes, Candollea 16: 393. 1958, syn. nov. Basionym: *Dombeya australis* var. *geayi* Hochr., Candollea 3: 31–32. 1926. TYPE: Madagascar. Toliara: province de Fort Dauphin, s.d. (fl., fr.), *F. Geay 6717* (holotype, P!; isotype, G not seen, G image!).

Inflorescences (1- to)3- to 6(7)-flowered. Sepals 5.5–6.3(–7.5) mm; petals 6.5–10.5 × 5.5–8 mm; style 2–2.8 mm.

Distribution, habitat, and phenology. *Dombeya australis* subsp. *australis* is usually found in littoral forests of extreme southeastern Madagascar, on sand; it is less often reported in low-elevation humid forest, sometimes along creeks, at elevations up to 105 m. It flowers from February through June; immature fruits have been collected in June.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya australis* subsp. *australis* is noted as Endangered or EN B1ab(iii)+2ab(iii). Fewer than five populations are known; the habitat has been unprotected and subject to degradation, although portions are reportedly to be protected in the future, and the populations are close enough together to be vulnerable to a single event.

Vernacular names. Berehoka (*Rajoharison & Tsiatrefy 83*), hafotrakarako (*Service Forestier 7428*).

Discussion. *Rabevohitra et al. 1894* has vegetative morphology typical of *Dombeya australis* subsp. *australis* but small, aberrant flowers, with unusually narrow petals and open appearance. It is not plausibly identifiable as a hybrid involving any other known species from the locality.

Additional specimens examined. MADAGASCAR. **Toliara:** Iabakoho, Antsotso Avaratra, *Birkinshaw et al. 1648* (MO); Fort Dauphin, Sainte Luce, *Decary 9931* (P), *9934* (P); Anosy, Antsotso, *Lowry et al. 6730* (MO); Mandena, *Rabevohitra 1798* (MO); Mandena, Mandromoromotra, *Rajoharison & Tsiatrefy 83* (MO); Fort Dauphin, Sainte Luce, 2 km W of Ambandrika, *Randrianasolo 342* (MO, P); Mandena, *Service Forestier 7428* (P); Bemangidy, N of Mahatalaky, *Service Forestier 11783* (P); Mandena, 24°57′S, 047°02′E, *Zarucchi et al. 7457* (P).

Hybrid or aberrant specimen. MADAGASCAR. **Toliara:** Tôlanaro, Mandena, *Rabevohitra et al. 1894* (MO, P).

8b. Dombeya australis Scott-Elliot subsp. **grandiflora** Arènes, Candollea 16: 393–394. 1958. TYPE: Madagascar. Farafangana: vestiges de forêt orientale, au S de Farafangana, le long de la route Farafangana–Manombo, 30 June 1954 (fl.), *Service Forestier 9209* (holotype, P!; isotypes, MO!, P [2]!, TEF not seen, TEF image!).

Inflorescences 1- to 3(4)-flowered. Sepals 6.5–8(–9.5) mm; petals (7–)8–12 × (4.5–)6–9(–10) mm; style 2.5–4.5(–5) mm.

Distribution, habitat, and phenology. *Dombeya australis* subsp. *grandiflora* is native to littoral forests of southeastern Madagascar, on laterite and basalt, or low-altitude humid forests on sand; it has been collected at elevations of 21–500 m. It appears to flower year-round; immature fruits have been collected in June and August.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya australis* subsp. *grandiflora* is noted as Vulnerable or VU B1ab(iii)+2ab(iii). Although several distinct populations are known, the area of occupancy is small, all populations are confined to a limited area, and most of the habitat is unprotected and subject to degradation.

Vernacular names. Hafopotsy (*Service Forestier 3802*), hafotra (*Service Forestier 14480*).

Discussion. The collection *Razakamalala et al. 2470* has short inflorescences and sparse stellate pubescence on twigs, inflorescences, and sepals; the leaves are narrowly elliptical, and the perianth is abnormally small. It appears intermediate between *Dombeya australis* subsp. *grandiflora* and *D. ranofotsyensis*, but the latter is not known from the area.

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** Atsimo-Atsinanana, Manombo, *Applequist et al. 248* (MO, P, TAN); Atsimo-Atsinanana, Vohipaho, *Applequist et al. 256* (MO, P, TAN), *258* (MO, P, TAN); Atsimo-Atsinanana, Manombo, *Applequist et al. 262* (MO, P, TAN), *264* (MO, P, TAN), *265* (MO, P, TAN), *266* (MO, P, TAN); Iabomary, 40 km S of Farafangana, *Rabenantoandro et al. 421* (MO, P), *424* (MO, P); Farafangana, Manombo, 23°01′56″S, 047°42′07″E, *Rabenantoandro et al. 793* (MO); Vangnokely, Farafangana, *Service Forestier 3802* (P); Ifanadiana, Mananjary, *Service Forestier 14480* (P); between Farafangana and Manombo, *Service Forestier 23934* (P). **Toliara:** Anosy, Iabokoho, Antsotso, *Rajoharison et al. 181* (MO); Anosy, Fenoambany, *Razakamalala et al. 4603* (MO).

Probable hybrid specimen. MADAGASCAR. **Toliara:** Fort-Dauphin, Iaboko[ho], Antsotso, *Razakamalala et al. 2470* (MO, US).

9. Dombeya capuroniana Arènes, Candollea 16: 391. 1958. TYPE: Madagascar. Antsiranana: massif de la Montagne d'Ambre, rives du Grand Lac, 9 Oct. 1954 (fl., fr.), *Service Forestier 11271* (holotype, P!; isotypes, BR not seen, BR image!, K not seen, K image!, P [2]!, TAN not seen, TAN image!, TEF not seen).

Shrub or tree to 15 m; twigs pale grayish brown, the youngest lepidote with a dense coating of strongly fimbriate scales; stipules caducous, lanceolate, 1.5–3.5 mm, fimbriate-lepidote; stipule scars on young twigs pale, hemielliptical to narrowly elliptical but small, not at all prominent. Leaves narrowly oblong-oblanceolate to narrowly oblong or narrowly oblanceolate, (4.5–)6–10.8 × 1–1.8(–2.3) cm; petiole 3–11 mm, fimbriate-lepidote; base rounded to cuneate with extreme base rounded; apex acute or rarely rounded or emarginate; margins usually irregularly crenulate-serrulate near apex, otherwise subentire, glands inconspicuous and present only near apex; both surfaces sparsely lepidote with fimbriate scales; basal veins 1 or seldom 3, with the outer very weak; secondary veins numerous, weak, mostly reticulodromous except near apex, visible on adaxial surface; domatia absent. Inflorescences 1- to 4(to 7)-flowered, occasionally appearing at least partly cymose; peduncle (1.2–)2–4.6 cm; pedicels 5–15 mm; peduncle and pedicels fimbriate-lepidote; bracteoles caducous, occasionally persisting in flower, borne slightly below flower, ovate to lanceolate, 1–1.5(–2) mm, sparsely lepidote. Sepals 4.5–6.8 mm, sometimes reflexed, lepidote; petals white, 7–9.5 × 5–8 mm, broadly obovate, moderately asymmetrical; corona 0.5–1.7 mm; stamens 10; filaments 0.8–2 mm; anthers 0.6–1 mm; staminodes linear to narrowly spatulate, 3–3.5 mm; style (1.5–)3–3.5 mm, basally lepidote; style branches two or three, 1–2 mm, variably shaped; ovary lepidote. Developing fruit roughly globose or broadly ellipsoid, to 5 mm diam., pale, lepidote; possibly only 1(or 2) seeds developing per fruit, irregularly ellipsoid, pale brown, to at least 3 mm; mature fruit not seen.

Distribution, habitat, and phenology. *Dombeya capuroniana* is endemic to Montagne d'Ambre in northern Madagascar; the reported altitude range is 1100–1250 m. It flowers in June through October; immature fruits have been collected in October.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya capuroniana* is noted as Vulnerable or VU, D. This species is known only from the area of Montagne d'Ambre; it is, therefore, susceptible to natural disasters, though its habitat is protected, and the paucity of collections suggests that it is rare.

Discussion. *Dombeya capuroniana* is distinctive for its very narrowly oblanceolate, often more or less oblong leaves and fimbriate-lepidote indument throughout. Some similarities are observed between this species and the similarly lepidote *D. andrahomanensis* Arènes (the sole species Arènes placed within *Dombeya* ser. *Squamigerae*). Both have a single basal leaf vein, numerous weak secondary veins, and sometimes umbelliform-cymose inflorescences (though that is seen as an aberration in a number of other species). However, *D. andrahomanensis* has much narrower stipule scars, short-peduncled inflorescences, and typically narrowly elliptical leaves. It is, therefore, not possible to presume a close relationship between the two; the true affinities of both species are uncertain.

Additional specimens examined. MADAGASCAR. **Antsiranana:** Montagne d'Ambre PN, *Andrianantoanina & Bezana 151* (MO, P); forêt d'Ambre, *Perrier de la Bâthie 17732* (P).

10. Dombeya mananarensis Arènes, Candollea 16: 400. 1958. TYPE: Madagascar. Toliara: bassin de réception de la Mananara, affluent du Mandrare, pentes occidentales des montagnes entre l'Andohahela et l'Elakelaka, entre Ampahiso et Mahamavo (gneiss), 500–800 m, Jan.–Feb. 1934 (fl.), *H. Humbert 13758* (holotype, P!; isotypes, BR not seen, BR image!, K [2] not seen, K [2] images!, MO!, P [3]!, PRE not seen, PRE image!, TAN not seen, TAN image!).

Tree; twigs grayish brown, the youngest reddish and finely stellate; stipules caducous, lanceolate-acuminate, 2.5–4 mm, sparsely stellate to glabrous;

stipule scars on young twigs prominent, pale or conspicuously darkened, hemielliptical. Leaves narrowly elliptical to narrowly oblong-elliptical or lanceolate, 4–7 × 1.4–2.5 cm; petiole (7–)11–20 mm, densely stellate with fine reddish trichomes; base rounded, often slightly asymmetrical; apex acute; margins serrulate with small, often rounded teeth with glands located in tooth apices; abaxial surface sparsely pubescent with fine, mostly stellate trichomes and tiny papillae or glabrate, adaxial surface glabrous; basal veins 5, the outermost weak, or 3; secondary veins above the base 6 to 8 per side, weak, visible on apical surface; domatia absent. Inflorescences (1)2- to 4-flowered; peduncle 1.5–5.1 cm; pedicels 4–9(–13) mm; peduncle and pedicels sparsely reddish stellate; bracteoles caducous, ovate, 1.2–2.3 mm, glabrous, borne immediately or very slightly below flower. Sepals 5.4–5.8 mm, reflexed, shallowly fused at base, sparsely stellate, sometimes becoming glabrous; petals white, (8–)9.5–11.7 × 6–8(–10) mm, broadly obovate, somewhat asymmetrical; corona 1.5–2 mm; stamens 10; filaments 0.5–1.2 mm; anthers pale yellow, 0.8–1 mm; staminodes linear, 3.5 mm; style 3–3.5 mm; branches three, 1.5 mm, curved; ovary with dense indument of large flattened stellate trichomes.

Distribution, habitat, and phenology. *Dombeya mananarensis* has been collected from a single location in southeastern Madagascar, on gneiss at an elevation of 500–800 m; it was flowering in January or February.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya mananarensis* is noted as Data Deficient or DD. Although the species is known only from the type collection, botanical specimens from the area of the Mandrare are scarce, except for Humbert's collections, and few inferences about habitat quality or population size can be made.

Discussion. *Dombeya mananarensis* most closely resembles *D. ranofotsyensis*, as both species have leaves of modest size with a rounded base, sparse stellate indument on most parts, and relatively large flowers. However, the indument is in large part reddish; the leaves sometimes tend to be lanceolate and are somewhat asymmetrical at the base with often five basal leaf veins; the abaxial leaf surface is somewhat papillate as well as stellate; the peduncles are unusually long; the style is unusually long and 3-branched; and the ovary bears large flat-stellate trichomes.

11. Dombeya mandenensis Arènes, Candollea 16: 398–399. 1958. TYPE: Madagascar. Toliara: Mandena, à 12 km au N de Fort Dauphin, forêt sublittorale, sur sables, July 1954 (fl.), *Service Forestier 9223* (holotype, P!; isotypes, K not seen, K image!, P!, TAN not seen, TAN image!, TEF not seen, TEF image!).

Small tree to 8 m, to 25 cm diam., sometimes shrubby or much-branched; twigs thick, grayish, glabrous; stipules deltoid, 4–6 mm, reddish brown, mostly glabrate, sometimes with a pubescent keel; stipule scars on young twigs very prominent, pale, irregularly crescent-shaped to transversely obdeltoid, to 4.2 mm broad. Leaves narrowly elliptical to oblong-elliptical, occasionally tending to oblanceolate or lanceolate especially when young, (8.5–)11–25 × (2.3–)2.7–5 cm; petiole (3–)4–6 mm, initially stellate, sparsely scurfy-pubescent to glabrous at maturity; base ± cuneate, sometimes rounded at extreme base; apex acute to rounded or emarginate; margins serrulate with inconspicuous glands in tooth apices; both surfaces densely stellate in very young leaves, usually becoming glabrous, occasionally remaining sparsely stellate especially beneath; basal veins 3, the lateral weak; secondary veins above the base numerous, visible though not conspicuous on adaxial surface; domatia absent. Inflorescences (2- to)4- to 12-flowered; peduncle sometimes virtually absent, sometimes 1–5.4 cm, at least sparsely stellate, sometimes stellate with white flocculent coating; pedicels 5–12(–19) mm, stellate, often with white flocculent coating; bracteoles caducous or sometimes persistent to anthesis, ovate with often cuspidate apex, 3–4.5 mm, reddish brown, scurfy-pubescent basally with broad glabrous margins, borne immediately beneath flower. Sepals 6.8–9.5 mm, sometimes with a curved tip, not reflexed or reflexed, stellate; petals white, 8–11 × 5–7.5(–9) mm, broadly obovate, at least somewhat asymmetrical; corona 0.6–1 mm; stamens (10 to)15; filaments white, 1.5–3 mm; anthers orange, 0.9–1.5 mm; staminodes linear, 5–7 mm; style 4–5 mm; style branches three, 1.5–2 mm, rarely divided to ovary and to 4 mm; ovary densely stellate. Fruit densely stellate-pubescent, subglobose, sometimes vertically compressed, shallowly lobed, 5–10 mm diam.; seeds probably 3 per fruit, reddish brown, irregularly shaped, to 3.3 mm, roughly triangular in cross-section, shriveled and with deep wrinkles (mature seeds possibly not seen).

Distribution, habitat, and phenology. *Dombeya mandenensis* is native to littoral and sublittoral forests of extreme southeastern Madagascar, on sand at

elevations of 0–25 m. It appears to flower, and possibly set fruit, year-round.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya mandenensis* is noted as Vulnerable or VU B1ab(iii)-2ab(iii). Only two distinct populations exist (around Mandena and Sainte Luce) in a very small geographic area; the habitat has suffered significant fragmentation and continuing degradation, although it is reportedly to be protected in the future.

Vernacular names. Berehoka (*Rabenantoandro et al. 351*, *Ramison 214*, *Ramison & Armand 370*), savalengo (*Decary 4169*).

Discussion. *Dombeya mandenensis* is a highly localized endemic species distinctive for features including the leaf size, unusual stipule and bracteole morphology, very conspicuous large, elongated, and raised stipule scars, and whitish pubescence on young parts and inflorescences, often accompanied by a flocculent coating. Peduncles in this species can be far longer than the pedicels or virtually lacking. The flowers are reported to have an odor of jasmine (*Dumetz et al. 785*).

Rabevohitra 2051 has elliptical leaves to 3 cm broad but only 6–7.5 cm long; all parts are glabrous or glabrate, except that the ovary is sparsely stellate. The stipule scars are smaller than usual for *Dombeya mandenensis*; the inflorescence is more slender and the flowers smaller; and the sepals are reflexed. This specimen is plausibly interpreted as a hybrid of *D. mandenensis* and *D. australis* subsp. *australis*, both of which occur in the vicinity.

Additional specimens examined. MADAGASCAR. **Toliara:** Fort Dauphin, *Decary 4169* (P); Mandena, *Dorr et al. 3991* (MO, P); Mandena, *Dumetz et al. 658* (MO), *734* (MO, P), *785* (P); Sainte Luce, *Faliniaina et al. 13* (MO); Mandena, *McPherson & Dumetz 14327* (MO, P); Sainte Luce, *McPherson et al. 14833* (MO); Sainte Luce, *Rabenantoandro et al. 351* (MO); Anosy, Mandena, *Rabenantoandro 1768* (MO); Mandena, *Rabevohitra et al. 1757* (MO); Mandena, *Rabevohitra 2021* (P); Anosy, Sainte Luce, *Raharimampionona 75* (P); Anosy, Mandena, *Ramison 214* (MO); Anosy, Mandena, *Ramison & Armand 370* (MO); Matalaky [Sainte Luce], *Randrianaivo et al. 862* (MO, P); Mandena, *Randrianasolo 577* (MO, P); Sainte Luce, *Razakamalala et al. 4329* (MO, US).

Hybrid specimen. MADAGASCAR. **Toliara:** Manafiafy [Sainte Luce], *Rabevohitra 2051* (MO).

12. Dombeya mangorensis Arènes, Candollea 16: 399–400. 1958. TYPE: Madagascar. Toamasina: moyenne vallee du Mangoro, 10 Sep. 1942 (fl.), *R. Decary 18531* (holotype, P!; isotypes, BR not seen, BR image!, K not seen, K image!).

Small tree with long lianoid branches; twigs grayish brown, the youngest pubescent; stipules caducous, narrowly lanceolate to linear, 2–4 mm, stellate; stipule scars on young twigs small but slightly broadened and often pale. Leaves oblong to oblanceolate, 6–10.5 × 2.5–4.6 cm; petiole 1–5(–8) mm, bearing small branched or unbranched trichomes, becoming glabrate; base shallowly cordate to rounded; apex usually cuspidate, occasionally emarginate; margins irregularly crenulate to crenate-serrulate or subentire, with inconspicuous glands located in tooth apices or small rounded projections; both surfaces usually glabrous at maturity, abaxial surface sometimes with few small stellate trichomes mostly on midrib; basal veins (3 to)5 to 7; secondary veins above base numerous or 7 to 10 per side, visible on adaxial surface; domatia absent. Inflorescences (1)2- to 6-flowered, rarely perhaps cymose; peduncle (3–)4.5–8 cm; pedicels 6–14 mm; peduncle sparsely stellate-scaly, pedicels more densely stellate; bracteoles caducous, ovate, 4 mm, stellate, borne close beneath flower. Sepals 7–9 mm, narrow, mostly not reflexed, densely stellate; petals 13–15 × 10–12 mm, broadly obovate, asymmetrical; corona 1.3–1.4 mm; stamens ca. 15; filaments 2–4 mm; anthers 0.8 mm; staminodes linear, 5–7 mm; style 6–7 mm; branches two or three, 2–2.5 mm, flattened, tightly curled; ovary densely short-stellate (almost long-fimbriate lepidote).

Distribution, habitat, and phenology. *Dombeya mangorensis* is known only from the vicinity of the Mangoro River in eastern Madagascar, presumably in humid forest; flowering material has been collected in September.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya mangorensis* is noted as Critically Endangered or CR B1ab(iii)-2ab(iii); only one locality is known, from which two specimens were simultaneously collected, and no further collections have been made. Unprotected forests in the area are under great threat from human activity.

Discussion. *Dombeya mangorensis* is the only species of *Dombeya* ser. *Mananarenses* that occurs in Toamasina. It has larger flowers than any other species of the series, five to seven basal leaf veins, and pubescent indument on the young twigs.

Additional specimens examined. MADAGASCAR. **Toamasina:** Mangoro, *Decary 18530* (P).

13. Dombeya ranofotsyensis Arènes, Candollea 16: 392. 1958. TYPE: Madagascar. Toliara: Ranofotsy, distr. de Fort Dauphin, pentes gneissiques, 29 July 1932 (fl., fr.), *R. Decary 10177* (holotype, P!; isotypes, B not seen, B image!, BR not seen, BR image!, P!).

Small tree or large shrub; twigs grayish to dark brown, the youngest ± short-stellate; stipules caducous, lanceolate, 1.5–2 mm, glabrous or sparsely stellate; stipule scars on young twigs dark or pale, hemielliptical to narrowly crescent-shaped. Leaves narrowly elliptical to oblanceolate or narrowly obovate, 3.5–7 × 1.1–3.2 cm; petiole 5–12(–17) mm, short-stellate or glabrate; base rounded to cuneate; apex rounded to acute; margins crenulate to subentire or serrulate with teeth usually rounded, glands usually in or near tooth apices or projecting slightly from margin; youngest leaves sparsely stellate, mature leaves glabrate with few small stellate trichomes, mostly along veins and at base; basal veins 3; secondary veins above the base (4 to)6 to 10 per side or numerous, visible on adaxial surface; clusters of trichomes sometimes present in clefts in axils of basal leaf veins, but no definite domatia present. Inflorescences 1- to 3-flowered; peduncle 0.7–2.5(–3.5) cm or rarely absent in single-flowered inflorescences, glabrous or sparsely stellate; pedicels 5–12 mm, glabrous or sparsely stellate; bracteoles caducous, ovate, 1–1.8 mm, glabrous, borne immediately beneath flower. Sepals 4.5–7 mm, almost all reflexed, glabrate with very few small stellate trichomes; petals white or yellow to orange (probably only post-anthesis), 8–12.5(–14) × 5.4–9.5(–11) mm, broadly obovate to suborbicular, moderately asymmetrical; corona 1.3–2.4 mm; stamens 10(to 15); filaments 0.5–1.5 mm; anthers 0.7–1.1 mm; staminodes linear, 3.5–4.5 mm; style 1–2.5 mm; style branches two, 1.5–2.5 mm, ± curled; ovary stellate. Fruit cylindrical, to at least 5–7 mm high × 2.5 mm diam., pale, sparsely stellate to papillate, petals remaining closed around developing fruit; developing seeds 1 or 2 per fruit, 0.8–0.9 mm, brown, suborbicular, somewhat asymmetrically compressed (probably no mature fruits seen).

Distribution, habitat, and phenology. *Dombeya ranofotsyensis* is native to a limited portion of extreme southeastern Madagascar but is reported in habitats ranging from humid and transitional forest to dry forest, bush, and thickets; it is known to occur on gneiss. The species has been collected from elevations of 1–779 m. It flowers from December through July; fruits, all possibly immature, have been collected in May, July, and December.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya ranofotsyensis* is noted as Vulnerable or VU B1ab(iii)+2ab(iii). Six distinct populations are known, but all are in a small area that could be affected by a single event; natural habitat in the area, though partly protected, has been degraded.

Vernacular name. Hatapiso (*Birkinshaw et al. 425*).

Discussion. *Dombeya ranofotsyensis* closely resembles and is presumed to be closely related to *D. australis*, from which it differs in features including its more elliptical leaf shape with generally crenulate rather than serrulate margins, pubescence on most plant organs, shorter and fewer-flowered inflorescences, smaller and less persistent bracteoles, and the conformation of the developing ovary (cylindrical, rather than subglobose). The peduncle of *D. ranofotsyensis* is usually, but not always, longer than the pedicels, whereas the peduncle of *D. australis* is usually more than 3.5 cm long and virtually always exceeds the pedicels.

The wood is reportedly used for construction (*Birkinshaw et al. 425*), although the plant does not attain a large size.

The collection *Eboroke 996* resembles *Dombeya ranofotsyensis* but has filaments to 6.5 mm and equal to or exceeding the staminodes, a long corona narrowed above the ovary, a long style with short branches, unusually narrow petals, and leaves with oblique leaf bases and short-acuminate or cuspidate apices. This morphology can be fully explained as the result of hybridization between *D. ranofotsyensis* and *D. tulearensis* Arènes, both of which occur at Andohahela National Park.

Additional specimens examined. MADAGASCAR. **Toliara:** Anosy, Andohahela, mont Apiky, *Andriamihajarivo et al. 1146* (MO); Tsimelahy, Andohahela, parcelle 2, path E from Tsimelahy to Ambohibory massif, *Birkinshaw et al. 425* (P); Antanimora, Fort Dauphin, *Decary 4314* (MO, P); Baie des Galions (Ranofotsy), *Humbert 29019* (P [2]); Anosy, Ranopiso, SW of Ankilivalo, *Rakotovao et al. 5493* (MO); Andohahela (parcel 3), Ankazofotsy, *Randriamampionona 991* (P); Analamatsaka (parcel 3), Andohahela, *Ratovoson et al. 98* (MO, P); 10 km NE of Tsimelahy, Ranopiso, Fort Dauphin, *Ravololonanahary et al. 93* (MO, P); Italy (Baie de Ranofotsy), Fort Dauphin, *Service Forestier 20504* (MO [2], P [3]).

Hybrid specimen. MADAGASCAR. **Toliara:** Andohahela, 8 km W of Ambatoabo, Vohidafa, *Eboroke 996* (P).

14. Dombeya rariflora Arènes, Candollea 16: 397–398. 1958. TYPE: Madagascar. Toliara: falaise cotière NW du Cap Sainte-Marie, vers Lavano-

no, bush xérophile sur calcaire, 1–150 m, 8 Mar. 1955 (fl.), *H. Humbert 29320* (holotype, P!; isotypes, P!, TAN not seen, TAN image!, TEF not seen, TEF image!).

Tree to 7 m, with DBH to 20 cm, or shrub to 4 m; twigs grayish brown, the youngest sparsely pubescent with small scurfy stellate trichomes to glabrate; stipules persistent at twig apices, narrowly deltoid-acuminate, (3–)5–8 mm, sparsely stellate to glabrate; stipule scars on young twigs usually prominent, pale or occasionally dark, irregularly crescent-shaped to broadly hemielliptical. Leaves narrowly elliptical, occasionally tending to oblanceolate, (3.7–)5.5–12.5 × (1.3–)1.8–3.5 cm; petiole (3–)4–6(–10) mm, sparsely stellate to glabrate; base narrowly rounded to cuneate; apex acute to rounded; margins apically serrulate to crenulate-serrulate with inconspicuous glands in apices of teeth; abaxial surface glabrous to sparsely stellate, adaxial surface glabrous; basal veins 3, the lateral weak; secondary veins above the base numerous or 7 to 10 per side, often inconspicuous on adaxial surface; domatia absent. Inflorescences (1-to)3- or 4-flowered; peduncle 1.5–6(–14) mm, sparsely stellate; pedicels 1–4(–9) mm, fairly thick, often somewhat flattened and angular, at least sparsely stellate; bracteoles persistent, narrowly deltoid, linear to subulate with a broad base, or less often broadly deltoid-acuminate, (3–)5–7 mm, sparsely stellate, borne immediately beneath flower. Sepals 4–6.5(–7.4) mm, not reflexed, stellate; petals white, 4.5–6.1(–6.5) × 2.8–3.6(–6) mm, obovate with asymmetrical apex or occasionally broadly obovate; corona 0.5–0.8 mm; stamens 10; filaments 0.7–1.5 mm; anthers 1–1.4 mm; staminodes linear to narrowly spatulate, 2.5–4 mm; style 1.5–3 mm; style branches three, 1–2 mm, spreading or curled; ovary densely white-stellate with long-armed trichomes. Fruit densely stellate, greenish when young, subglobose, shallowly lobed and vertically compressed, 4–7 mm diam.; seeds 3 to 6 per fruit, pale to medium brown, broadly ovoid to ellipsoid, 2.5–3.5 mm, strongly laterally compressed (mature seeds possibly not seen).

Distribution, habitat, and phenology. *Dombeya rariflora* is native to littoral forest and bush near sea level in extreme southeastern Madagascar, on sand or rarely limestone. The species has been collected at elevations to 100 m. It usually flowers from January to March, though flowering collections have been made in June and October; fruits have been collected from February to April.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya rariflora* is noted as Vulnerable or VU, D. All recent collections have come from a single locality, the littoral forest of Petriky, part of which is putatively to be protected, although it does not yet have formal status as a protected area. Repeated recent collections demonstrate the persistence of that population but not that of the type locality near Cape Sainte Marie (a protected area).

Vernacular names. Berehoka (*Randriatafika et al. 365*), mandoavato (*Randriatafika 711*), mandohavato (*Ramison 241*).

Discussion. *Dombeya rariflora* is distinguished by having usually very short peduncles and pedicels, persistent stipules subtending the small inflorescences, and rather sepaloid persistent bracteoles. Bracteoles that are both large and persistent are very unusual in *Dombeya* sect. *Decastemon*, and this character may suggest an affinity to *D. australis*, which has relatively large and persistent bracteoles (though less so than in *D. rariflora*).

Additional specimens examined. MADAGASCAR. **Toliara:** Fort Dauphin, Petriky, *Dumetz et al. 799* (MO, P); Fort Dauphin, Petriky, *Dumetz 1164* (MO); Tôlanaro, Petriky, *Gereau et al. 3210* (MO); Tôlanaro, Petriky, *Gereau et al. 3359* (MO, P); Baie des Galions (Ranofotsy), Fort Dauphin, *Humbert 28993* (P); Tôlanaro, *McPherson et al. 14767* (MO, P); Tôlanaro, Petriky, *Rabevohitra 2101* (MO, P); Anosy, Tôlanaro, Petriky, *Ramison 241* (MO); Petriky, Fort Dauphin, *Randriatafika et al. 73* (MO, P); Fort Dauphin, Petriky, *Randriatafika et al. 365* (MO, P); Anosy, Tôlanaro, Petriky, *Randriatafika 711* (MO).

IV. Dombeya ser. **Pentandrae** Appleq., ser. nov. TYPE: *Dombeya milleri* Appleq. & Bosser.

Domatia present in axils of secondary veins; stamens 5; staminodes opposite petals, broad and spreading; corona and filaments short; maturing ovary somewhat inflated with empty space inside before seeds develop.

Young twigs stellate to scaly stellate or fimbriate-lepidote; stipule scars irregularly hemielliptical, pale, sometimes slightly prominent, or stipules or basal portions of stipules persisting. Leaves elliptical or narrowly elliptical to ovate, lanceolate, or oblong-elliptical, or obovate; basal veins 3 to 5; secondary veins 3 to 5; domatia usually present in axils of secondary veins and sometimes also at base; petioles stellate to fimbriate-lepidote. Inflorescences umbellate, stellate, or fimbriate-lepidote; peduncles 0.5–20 mm, shorter or longer than pedicels. Petals broadly obovate to broadly obdeltoid, slightly to strongly asymmetrical, not convex; stamens 5; staminodes conspicuously oppositipetalous, longer than longest fertile filaments; ovary stellate, in one

species possibly papillate or scaly. Immature fruit, where known, becoming inflated before seeds develop.

Distribution and habitat. *Dombeya* ser. *Pentandrae* is native to deciduous forests in the extreme north of Madagascar at low altitudes (100–385 m).

Discussion. *Dombeya* ser. *Pentandrae* is described to encompass a group of three species whose floral morphology is unique within *Dombeya*, while not fitting into any related genus as presently defined. Skema's (2012) phylogeny suggests that this group may occupy a basal position. The fertile stamens are reduced to five and are clearly oppositisepalous. In contrast, almost all other species of *Dombeya* have 10 or more stamens, which are usually more or less oppositipetalous, though generally not conspicuously so due to the form of the androecium. The corona and filaments are unusually short, in two species being so reduced as to be almost entirely hidden by the ovary, and the staminodes broad and often spreading over the center of the petals. The style is divided to the base. Morphological synapomorphies, therefore, afford considerable confidence that this is a natural group. The first of the included species to be recognized was described only recently (Skema & Dorr, 2010), and two further species are newly described. Since some of the localities involved have been heavily collected, the paucity of collections suggests that the three species of *Dombeya* ser. *Pentandrae* are rare. *Dombeya ramiovensis*, which has five to 10 stamens, multiple pairs of domatia, and immature fruit with empty space inside, was herein placed in *Dombeya* ser. *Apikyenses* but might prove to be related to *Dombeya* ser. *Pentandrae*. It is not now placed within the latter series because the staminodes are oppositisepalous and linear, and the style is sometimes deeply divided but not to the base; other individually less important characters (e.g., relatively narrow petals, reflexed sepals, long corona and filaments) also bear more resemblance to less problematic species of *Dombeya* ser. *Apikyenses* than to the rather homogenous group of *Dombeya* ser. *Pentandrae*.

KEY TO THE SPECIES OF *DOMBEYA* SER. *PENTANDRAE*

1a. Leaf margins irregularly pinnately lobed and sinuate ..... 15. *D. gautieri*
1b. Leaf margins subentire to crenulate.
  2a. Leaves obovate with rounded to emarginate apices; petioles, leaves, and inflorescences fimbriate-lepidote to semi-stellate with flattened trichomes ..... 16. *D. milleri*
  2b. Leaves narrowly elliptical to lanceolate, oblong-lanceolate, or oblong-elliptical with acute apices; petioles, leaves, and inflorescences stellate ..... 17. *D. ratovosonii* Appleq.

15. Dombeya gautieri Dorr & Skema, Kew Bull. 65: 305. 2010. TYPE: Madagascar. Antsiranana: sous-préfecture de Vohemar, commune rurale de Daraina, Daraina, forêt de Solaniampilana–Maroadabo, 13°05.69′S, 049°34.89′E, 100 m, 11 Mar. 2004 (fl.), *L. Gautier et al. 4578* (holotype, US!; isotypes, G not seen, MO!, P not seen, TEF not seen).

Shrub to 2.5 m; twigs dark reddish brown, the youngest densely stellate; stipules persistent, subulate with broadened base, 2–3 or less than 1 mm, stellate, becoming glabrate; on young twigs stipule bases persist after stipules and leaves are lost. Leaves ovate to narrowly ovate, 3.3–5.7 × 2–2.9 cm; petiole 2–3 mm, densely stellate; base cuneate to rounded; apex acute to obtuse or rounded; margins irregularly pinnately lobed and sinuate, sparsely ciliate, with glands absent or very inconspicuous; adaxial surface sparsely pubescent with simple and 2-branched trichomes, stellate on veins; abaxial surface sparsely stellate; basal veins 1, the first pair of veins above the base weak; secondary veins above the base (4)5 per side, sometimes craspedodromous, often weakening sharply before margin, visible on adaxial surface; domatia present, small, roofed, basal and in axils of lower secondary veins. Inflorescences (1)2- or 3-flowered, often paired; peduncles 0.6–2 mm; pedicels 6–10 mm, longer than peduncle; peduncle and pedicels stellate; bracteoles sometimes persisting to anthesis, 0.5–1 mm, awl-shaped, stellate, borne immediately beneath flower. Sepals 3–4 mm, not reflexed at anthesis, stellate; petals white, 2.5–3 × 3.5–4 mm, broadly obovate, strongly asymmetrical; corona 0.5–0.6 mm; stamens 5; filaments 0.4–0.5 mm; anthers 0.5–0.8(–1) mm; staminodes white, lanceolate with a narrowed base, petaloid, 3–3.7 mm; styles 2, divided almost to ovary, 0.6–0.8 mm, glabrous; immature ovary papillate or possibly scaly stellate. Fruit unknown.

Distribution, habitat, and phenology. *Dombeya gautieri* is known only from the type collection, which was collected from a low-altitude (100 m) dry forest in northeastern Madagascar; it was flowering in March.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya gautieri* is noted as Critically Endangered or CR B1ab(iii)-2ab(iii). The type locality is not protected, and since the area has been well collected in recent years, the

absence of other collections suggests that the population is very small.

Discussion. *Dombeya gautieri* was recently described by Skema and Dorr (2010), who noted a series of characters that distinguished it from all other then-recognized species of *Dombeya*, including its pinnately lobed leaves (with rare multiple domatia), stamens reduced in number to five, short corona and filaments, and unusually broad, spreading staminodes, which they termed petaloid. The staminodes, like those of two related species newly described below, are conspicuously oppositipetalous, whereas *Dombeya* is remarked for having usually (though not always consistently) more or less oppositipetalous stamens and oppositisepalous staminodes. Skema and Dorr considered the possibility of placement in some other genus; however, placement in any other recognized genus was not supportable on morphological grounds. *Dombeya milleri* and *D. ratovosonii* have a similar floral morphology in an even more extreme form, in which the corona is so short that it is completely concealed by the ovary; they do not share the very persistent stipules of *D. gautieri*.

16. Dombeya milleri Appleq. & Bosser, sp. nov. TYPE: Madagascar. Antsiranana: Montagne des Français, along trail from King's Lodge to ruins of fort, deciduous forest at summit on karst, 12°19′28″S, 049°20′14″E, 290 m, 19 Jan. 2003 (fr.), *J. S. Miller, W. Applequist, J. Rabenantoandro & R. Ranaivojaona 10695* (holotype, MO!; isotypes, G!, P not seen, TAN not seen, US not seen). Figure 2.

Diagnosis. Distinguished from *Dombeya gautieri* Dorr & Skema by obovate, unlobed leaves, staminodes narrower, corona and filaments shorter and hidden by ovary, ovary stellate.

Tree to 5 m; twigs grayish brown, the youngest fimbriate-lepidote or semi-stellate with flat long-fimbriate scales, the leaves somewhat congested toward twig apices; stipules caducous, lanceolate to deltoid, 1–2 mm, sparsely scaly stellate; stipule scars on young twigs irregularly hemielliptical to broadly hemielliptical, pale or seldom dark especially at twig apices, not or slightly prominent. Leaves numerous, obovate, 1.5–5.6 × 0.9–2.5 cm; petiole 1.5–6 mm, fimbriate-lepidote; base rounded to cuneate; apex shallowly emarginate to rounded with midrib sometimes projecting very slightly; margins subentire, with glands absent or few and inconspicuous; both surfaces sparsely fimbriate-lepidote to semi-stellate; basal veins 3(to 5), the outer usually weak; main secondary veins above base 3 to 5 per side, reticulodromous, usually visible but inconspicuous on adaxial surface; domatia sometimes present in axils of main secondary veins, seldom at base, small, roofed. Inflorescences 1 per node, 2- to 6-flowered; peduncle (1.5–)4–20 mm; pedicels 7–15 mm, sometimes curved shortly below flower, shorter or longer than peduncle; peduncle and pedicel sparsely fimbriate-lepidote to semi-stellate; bracteoles usually persistent, 1–1.8 mm, narrowly lanceolate-acuminate to awl-shaped, sparsely scaly stellate, borne immediately beneath flower. Sepals (1.5–)2–2.7 mm, not reflexed, scaly stellate; petals 4–6 × 4–6 mm, broadly obovate, apex truncate to mostly rounded and moderately asymmetrical, generally pressing open flat beginning shortly after anthesis and possibly rotate in living material; corona 0.2–0.4 mm, flattened and hidden by ovary; stamens 5, alternating with petals; filaments 0.2–0.4 mm, largely hidden by ovary; anthers 0.4–0.6 mm, deltoid; staminodes oppositipetalous, spatulate, 1.5–2.2 mm; styles 2, divided to ovary, 1.2–1.8 mm; ovary stellate. Immature fruit subglobose, to 2.5 mm diam., vertically somewhat compressed, stellate, with much empty space inside locules while developing ovules are still small; ovules 2 per locule, not winged; maturing seeds 1 per fruit, pale brown, broadly ellipsoid with irregularly concave sides, to at least 2 mm (possibly no mature seeds seen).

Distribution, habitat, and phenology. *Dombeya milleri* is endemic to Montagne des Français in extreme northern Madagascar. The newly described species occurs in deciduous forest on limestone and has been collected at 178 and 290 m in elevation. It flowers from December through February, with fruits collected in January and February.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya milleri* is noted as Vulnerable or VU, D. The species is known to exist at only one locality, but the habitat is still in relatively good condition and is soon to be designated as protected.

Discussion. *Dombeya milleri* shares an unusual floral morphology with *D. gautieri* but shows more extreme reduction in the corona and filaments. The flowers are small and after anthesis almost always dry in an open position (a character that is also conspicuous in certain other broad-petaled species, notably *D. lecomtei*). *Razafitsalama 1199* has a few deformed budding structures with numerous linear sterile parts in leaf axils.

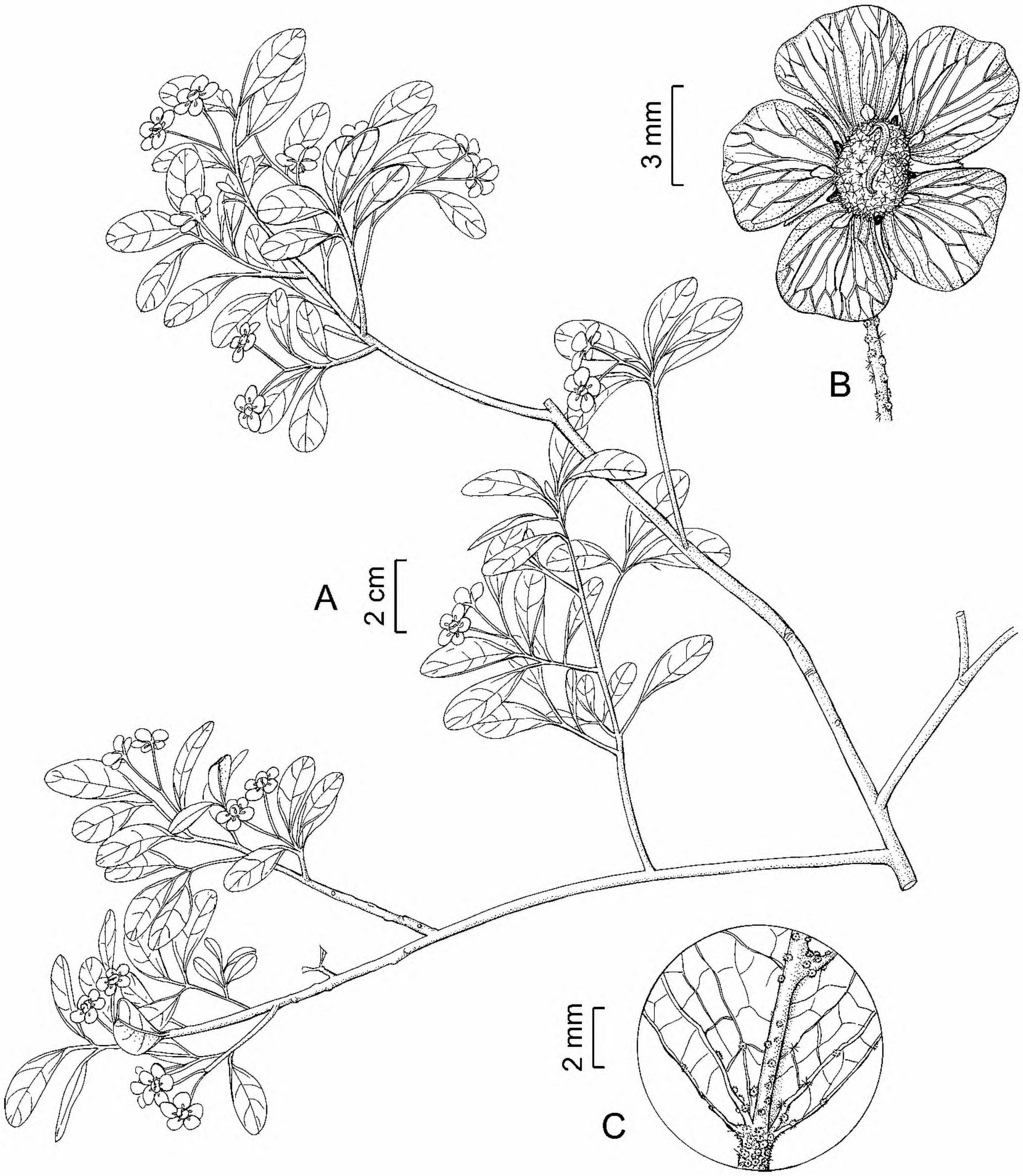


Figure 2. *Dombeya milleri* Appleq. & Bosser. —A. Habit. —B. Flower. —C. Domatia. A–C from *Miller et al. 10695* (MO).

Etymology. *Dombeya milleri* is named in honor of James S. Miller (MO, 1953–), an expert on the flora of Madagascar and primary collector of the selected type specimen. Jean Bosser (P) first identified this as a new species and hence shares authorship of the name.

Paratypes. MADAGASCAR. **Antsiranana:** DIANA, Montagne des Français, 12°19′22″S, 049°20′11″E, 178 m, 9 Dec. 2006 (fl.), *T. Andriamihajarivo et al. 1056* (MO); Montagne des Français, 12°19′28″S, 049°20′14″E, 290 m, 19 Jan. 2003 (fl.), *J. S. Miller*, *W. L. Applequist*, *J. Rabenantoandro & R. Ranaivojaona 10704* (MO); DIANA, Montagne des Français, 12°22′44″S, 049°21′57″E, 335 m, 25 Feb. 2007 (fr.), *L. J. Razafitsalama 1199* (MO, US); Montagne des Français, 28 Feb. 1964 (fl.), *Service Forestier 23242* (P [4]).

17. Dombeya ratovosonii Appleq. & Bosser, sp. nov. TYPE: Madagascar. Antsiranana: DIANA region, Montagne des Français, forêt d'Antaola-

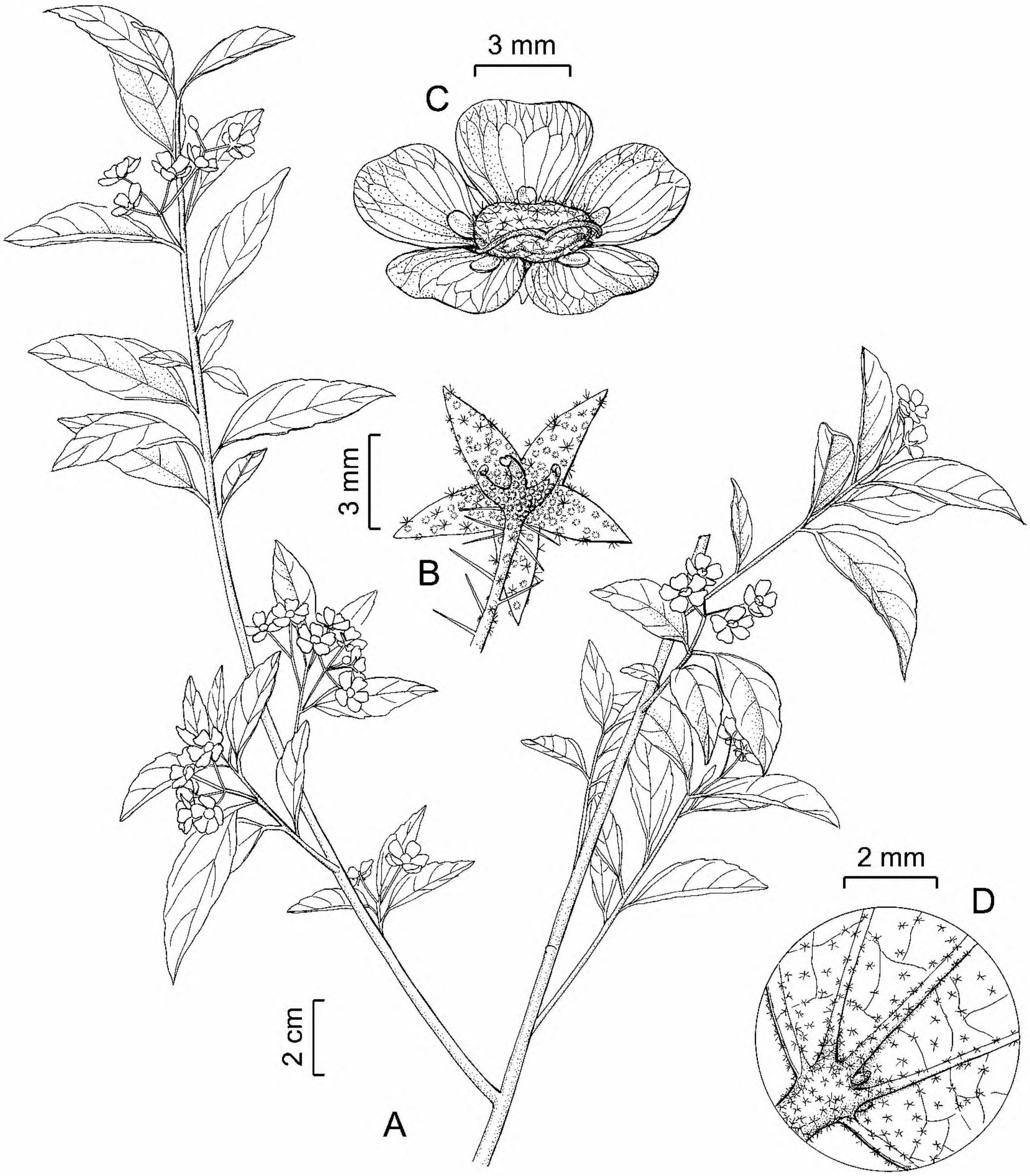


Figure 3. *Dombeya ratovosonii* Appleq. & Bosser. —A. Habit. —B. Calyx with bracteoles. —C. Flower. —D. Domatia. A–D from *Ratovoson et al. 1265* (MO).

naomby, forêt sèche, 12°22′25″S, 049°21′11″E, 385 m, 22 Mar. 2007 (fl.), *F. Ratovoson 1265* (holotype, MO!; isotypes, Centre National d'Application des Recherches Pharmaceutiques, not seen, P not seen, TAN not seen, US!). Figure 3.

Diagnosis. Distinguished from *Dombeya gautieri* Dorr & Skema by narrowly elliptical to oblong-elliptical or lanceolate unlobed leaves, staminodes narrower, corona and filaments shorter and hidden by ovary, ovary stellate. Distinguished from *D. milleri* Appleq. & Bosser by somewhat larger, narrowly elliptical to oblong-elliptical or lanceolate leaves, with acute apices and semicraspedodromous (vs. reticulodromous) secondary venation; indument of petioles, leaves, and inflorescences stellate (vs. long-fimbriate lepidote to flattened semi-stellate).

Shrub to 6 m or small tree; twigs pale brown, the youngest stellate and/or with scurfy indument;

stipules caducous, lanceolate to subulate, 3–5.5 mm, sparsely stellate; stipule scars on young twigs irregularly hemielliptical, pale, the distal margin slightly prominent. Leaves narrowly elliptical to lanceolate, oblong-lanceolate, or oblong-elliptical, 4–10.5 × 1.5–3.5 cm; petiole 4–10 mm, stellate; base rounded, occasionally slightly oblique; apex acute, often with a rounded tip; margins subentire to crenulate, with glands in rounded protrusions; both surfaces sparsely stellate; basal veins 3 to 5, if 5 the outer weak; main secondary veins above base 4 or 5 per side, visible but inconspicuous on adaxial surface, tertiary veins between midrib and long inner basal veins sometimes subscalariform; roofed domatia usually present in axils of basal veins with midrib, sometimes with a large swollen roof and very small opening, and small domatia often present in axils of secondary veins. Inflorescences 1(2) per node, 2- to 9-flowered; sometimes with 2 bracteoles subtending the group of pedicels; peduncle 1–13.5 mm; pedicels 6.5–13 mm, often curved shortly below flower, shorter or longer than peduncle; peduncle and pedicel stellate; bracteoles usually persistent, 0.7–1.6 mm, lanceolate to deltoid, sparsely stellate, borne immediately beneath flower. Sepals not reflexed, 2.4–3.3 mm, stellate; petals white, 4.5–5.4 × 4.5–5.5 mm, broadly obovate, slightly asymmetrical, generally pressing open flat and possibly rotate in living material post-anthesis; corona highly reduced (0.2 mm), flattened and hidden beneath ovary; stamens 5, alternating with petals; filaments 0.2 mm, hidden by ovary; anthers 0.4–0.5 mm, deltoid; staminodes oppositipetalous, spatulate, 1.4–2.2 mm; styles 2, divided to ovary, 1.7–2.8 mm; ovary stellate, at anthesis very flat. Immature fruit somewhat 2-lobed, to 2.8 × 2 mm, vertically somewhat compressed, stellate, with considerable empty space inside locules while developing ovules are still small; ovules 2 per locule, not at all winged; possibly only 1 seed maturing, immature seeds irregularly ellipsoid, to 1.4 mm; no mature seeds seen.

Distribution, habitat, and phenology. *Dombeya ratovosonii* is native to deciduous forests in extreme northern Madagascar; it has been reported on sand from elevations of 200 and 385 m. It flowers in February and March; immature fruits have been collected in March.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya ratovosonii* is noted as Vulnerable or VU, D; two locations relatively close together are known, one of which is in good condition and is to be protected in the future.

Discussion. *Dombeya ratovosonii* shares the extreme floral morphology of *D. milleri*; the two are presumed to be sister species. Leaves of *D. ratovosonii* are lanceolate to elliptic-oblong with more or less acute apices, whereas those of *D. milleri* are obovate with a rounded apex and somewhat smaller so far as is known from the very limited material. Leaves of *D. ratovosonii* have semicraspedodromous venation, as is usual in this section, whereas those of *D. milleri* are reticulodromous. The indument of the petioles, leaves, and inflorescences is stellate in *D. ratovosonii* versus fimbriate-lepidote or semi-stellate in *D. milleri*. Given the near certainty that the two are closely related, this provides yet another piece of evidence that the structure of the trichome or scale is quite labile in *Dombeya*.

Etymology. *Dombeya ratovosonii* is named in honor of Fidy Ratovoson (MO, 1972–), a Malagasy botanist and collector of the selected type specimen. Jean Bosser (P) first identified this as a new species and hence shares authorship of the name.

Paratypes. MADAGASCAR. **Antsiranana:** Sahafary, S of Diego [Suarez], Mar. 1962 (fr.), *M. Keraudren 1675* (P [3]); Sahafary, basin of the Saharaina, 200 m, 20 Feb. 1962 (fl.), *Service Forestier 20988* (P [4]).

V. Dombeya ser. **Selinala** Arènes, Candollea 16: 362. 1958. TYPE: *Dombeya selinala* Arènes.

Dombeya subser. *Digynae* Arènes, Candollea 16: 368. 1958. TYPE: *Dombeya digyna* Hochr.

Dombeya subser. *Mafimafy* Arènes, Candollea 16: 382. 1958. TYPE: *Dombeya mafimafy* Arènes [= *D. subviscosa* Hochr.].

Dombeya subser. *Sely* Arènes, Candollea 16: 379. 1958. TYPE: *Dombeya sely* Arènes.

Dombeya ser. *Valafotsy* Arènes, Candollea 16: 379. 1958. TYPE: *Dombeya valafotsy* Arènes [= *D. selinala* Arènes].

Young twigs stellate, papillate, small-scaled or glabrous; stipule scars usually narrow, dark, not prominently elevated or conspicuous (in one species, *Dombeya digyna*, small but broad, dark, slightly prominent). Leaves lanceolate to ovate (elliptical, oblong-elliptical, oblanceolate); basal veins (3 to)5 (to 7); secondary veins 3 to 10(to 12); domatia present or absent, basal and sometimes in axils of secondary veins; petioles stellate, papillate, or glabrous. Inflorescences umbellate (umbelliform cymes, or in *D. parvipetala*, few-flowered, mostly dichotomously branching cymes), stellate, papillate, glabrous, or small-scaled; peduncles 0.5–13(–22) mm, usually shorter than pedicels. Petals elliptical to obovate, symmetrical (to slightly asymmetrical), mostly convex at (or after) anthesis; stamens (10 to)15; staminodes

± oppositisepalous, shorter than or equal to (longer than) longest fertile filaments; ovary papillate or stellate, rarely glabrous.

Distribution and habitat. *Dombeya* ser. *Selinala* is widely distributed in dry forests and bush in northern, western, and southern Madagascar, at altitudes from sea level to 1200 m; one rare species (*D. micrantha* Appleq.) is recognized from humid eastern forest.

Discussion. *Dombeya* ser. *Selinala* is a relatively cohesive group of 13 species, almost all from dry habitats, that is characterized by small flowers with symmetrical or slightly asymmetrical petals that mostly become at least somewhat concave at (or after in *D. tulearensis* Arènes) anthesis. By contrast, species in other series have usually asymmetrical, never concave petals, as is observed also to be the norm for *Dombeya* subg. *Xeropetalum*. The leaves in *Dombeya* ser. *Selinala* are often lanceolate to ovate and frequently have domatia and/or a papillate indument. In all but one species (*D. parvipetala*), the sepals are usually or always reflexed post-anthesis. Over half of the included species have staminodes shorter than, or similar in length to, the longest filaments, whereas in all other series, the staminodes are almost always longer than the filaments. *Dombeya* ser. *Selinala* is suggested to represent a monophyletic group.

Dombeya parvipetala, formerly included in *Dombeya* sect. *Xeropetalum* because of its cymose inflorescences, is herein considered to belong within *Dombeya* sect. *Decastemon*. Its few-flowered, delicate inflorescences are dichotomously branching, whereas those of all other species of *Dombeya* sect. *Xeropetalum* are usually at least somewhat asymmetrical. The cymose condition here may be a reversal from an umbellate ancestral state, the capacity for which is demonstrated by aberrant short-cymose inflorescences in a number of other species. In other characters, such as near-symmetrical petals, narrowly lanceolate, papillate leaves, and xerophytic habitat preference, this species bears an obvious resemblance to the core group of *Dombeya* ser. *Selinala*.

KEY TO THE SPECIES OF *DOMBEYA* SER. *SELINALA*

1a. Inflorescence a slender, small but well-developed, mostly dichotomizing (or trichotomizing) cyme ..... 24. *D. parvipetala*

1b. Inflorescence an umbel or umbelliform cyme.

2a. Ovary papillate to glabrous.

3a. Young twigs, leaves, and petioles stellate, with trichomes at least partly reddish in color..... 29. *D. tulearensis*

3b. Young twigs, leaves, and petioles papillate to glabrous or whitish stellate or scaly.

4a. Staminodes shorter than longest filaments of fertile stamens.

5a. Leaves lanceolate, occasionally to narrowly ovate; bracteole scars at anthesis well below flower, usually near the midpoint of pedicel; petals narrowly obovate, 1.9–2.5 mm broad; ovary papillate at anthesis; Montagne des Français ..... 19. *D. ambohitrensis* Arènes

5b. Leaves lanceolate to ovate, elliptical, oblong, or narrowly lanceolate (rarely to oblong-oblanceolate or aberrantly obovate); bracteole scars at anthesis from immediately below flower to moderately lower (very rarely near midpoint of pedicel); petals obovate to elliptical, (2–)2.4–3(–5) mm broad; ovary, when papillate, usually with a few trichomes at apex and on base of style at anthesis; northwestern to southwestern Madagascar ..... 28. *D. subviscosa*

4b. Staminodes equal to or longer than longest filaments of fertile stamens.

6a. Domatia absent at base, present in axils of secondary veins and sometimes the largest tertiary veins arising from lateral basal veins; petals on type specimen < 4.5 mm; stamens 10; humid forest of eastern Madagascar ..... 23. *D. micrantha*

6b. Domatia absent or seldom present in axils of basal and secondary veins; petals normally > 4.5 mm; stamens 15; northwestern to southeastern Madagascar.

7a. Domatia present in axils of basal and secondary veins; pedicels < 10 mm, reddish papillate and ± stellate ..... 27. *D. sely*

7b. Domatia absent; pedicels > (8–)10 mm, glabrous to sparsely stellate.

8a. Bracteole scars at anthesis well below flower, with pedicel sometimes thickened above; petals without a red basal spot; calyx lacking a conspicuous basal cup, the upper portions of the sepals persistent; southeastern Madagascar .... 26. *D. selinala*

8b. Bracteole scars at anthesis immediately or closely below flower; petals often with a dark red basal spot; calyx with an unusually well-developed basal cup, the free portions of the sepals caducous in fruit; southwestern to northwestern Madagascar.

9a. Petioles stellate; leaves lanceolate to ovate, occasionally elliptical, some rarely to oblong-oblanceolate to obovate, (1.2–)1.8–3.6(–4.3) cm broad; margins usually crenulate-serrulate to serrulate with numerous small teeth, rarely crenate-serrate; bracteoles with ciliate margins ..... 18. *D. ambalabeensis* Arènes

9b. Petioles glabrous; leaves narrowly lanceolate to lanceolate, rarely to ovate, 1–2.4(–3) cm broad; margins usually with relatively few shallow teeth with a long forward-pointing basal margin; bracteoles with papillate margins..... ..... 20. *D. anakaensis* Arènes

2b. Ovary at least partly stellate.

10a. Young twigs papillate, bearing small irregular flattened scales, or glabrous.

11a. Leaves usually asymmetrical at the base, domatia absent; bracteole scars immediately below flower at anthesis; stamens 10; southwestern Madagascar around Ambovombe ..... 21. *D. danguyi*

11b. Leaves with the base occasionally oblique but not otherwise strongly asymmetrical, domatia present or absent; bracteole scars variably positioned, well below flower if leaves are narrowly lanceolate; stamens 15; southwestern to northern Madagascar.

12a. Leaf margins variably toothed, seldom crenulate-sinuate, not strongly sinuate; sepals mostly to entirely reflexed at least post-anthesis; staminodes shorter than longest filaments; northwestern to southwestern Madagascar ..... 28. *D. subviscosa*

12b. Leaf margins irregularly sinuate to crenate-sinuate; sepals mostly not reflexed; staminodes about equal to longest filaments; extreme northern Madagascar ..... 30. *D. vohemarensis*

10b. Young twigs at least sparsely stellate.

13a. Petals strongly reflexed ..... 25. *D. sakamaliensis* Appleq.

13b. Petals never strongly or consistently reflexed.

14a. Calyx stellate ..... 22. *D. digyna* Arènes

14b. Calyx glabrous (rarely with aberrant stellate patches on some flowers) or papillate.

15a. Domatia usually present at base and/or in axils of secondary veins of larger leaves; inflorescences (1- to)2- to 15(to 22)-flowered; pedicels papillate (rarely stellate); staminodes shorter than filaments of longest fertile stamens ..... 28. *D. subviscosa*

15b. Domatia absent; inflorescences 1- to 7(8)-flowered; pedicels stellate or glabrous (seldom papillate); staminodes at least slightly longer than filaments of longest fertile stamens.

16a. Bracteole scars at anthesis well below receptacle, with pedicel sometimes thickened above; petals without a red basal spot; calyx lacking a conspicuous basal cup, the upper portions of the sepals persistent; southeastern Madagascar ..... 26. *D. selinala*

16b. Bracteole scars at anthesis immediately or close below receptacle; petals often with a dark red basal spot; calyx with an unusually well-developed basal cup, the free portions of the sepals caducous in fruit; southwestern to northwestern Madagascar ..... 18. *D. ambalabeensis*

18. Dombeya ambalabeensis Arènes, Candollea 16: 389. 1958. TYPE: Madagascar. Fianarantsoa: bassin de la Malio (affluent de Mangoky) près d'Ambalabe, restes de forêt tropophile et bush xerophile, sur sables siliceux et grès, 400–450 m, 23–27 Nov. 1946 (fl.), *H. Humbert 19461* (holotype, P!; isotype, MO!).

Tree to 10–12(–20) m or shrub to 3 m; twigs dark brown, the youngest stellate to sparsely stellate with small white trichomes; stipules caducous, lanceolate, 1.4–2.5 mm, stellate; stipule scars on young twigs narrow but often relatively large and conspicuous. Leaves usually lanceolate to ovate (especially when young), occasionally elliptical, or rarely oblong-oblanceolate to obovate, (3.5–)5–9.5(–11.7) × (1.2–)1.8–3.6(–4.3) cm; petiole (2–)4–10(–12) mm, stellate; base ± rounded, occasionally tending toward cuneate, truncate, or very slightly cordate; apex acuminate, the immediate tip often rounded, or rarely acute; margins irregularly crenulate-serrulate to serrulate or rarely crenate-serrate, usually with many small teeth per side, rarely with few and/or larger teeth, with glands inconspicuous, located in tooth apices, or absent; both surfaces sparsely stellate, often bearing tiny flat papillae; basal veins 5 to 7(8), all but the inner pair weak; main secondary veins above base 5 to 10 per side with smaller similar veins often interspersed, visible on adaxial surface; domatia absent. Inflorescences 2- to 7-flowered, sometimes numerous and forming relatively large clusters; peduncle 2–6.5 mm, stellate or rarely glabrous, occasionally paired in leaf axils or thick and flattened in a large inflorescence and giving the appearance of 2 fused peduncles; pedicels (12–)16–25(–33) mm, glabrate with rare stellate trichomes or stellate patches in aberrant individual flowers; bracteoles rapidly caducous, lanceolate to ovate, oblong, or elliptical, 0.8–1.2 mm, with long-ciliate margins, the bracteole scars at flowering directly under receptacle or close to it. Sepals fused into unusually well-developed cup at base, the free portions 3–3.8 mm, reflexed with a gradual curve, with large, conspicuous glandular patches, caducous in fruit and the basal cup remaining and prominently visible, glabrous with rare stellate patches as an aberration in individual flowers; petals white, sometimes with a dark red basal mark, or pale yellow, (4.6–)6–7.5(–8) × (2–)2.6–4(–5) mm, elliptical to obovate, slightly asymmetrical, mostly concave; corona dark red, 1–1.7 mm; stamens 15; filaments 0.7–2.5 mm; anthers yellow,

0.8–1.1(–1.5) mm; staminodes narrowly spatulate, 2.4–3.3 mm; style white, 2.5–4 mm; style branches 2, white, 0.5–0.8 mm; ovary glabrous or papillate (apically stellate). Fruit subglobose with a narrowed apex where style base persists at least through most of development, 3–4(–4.5) mm diam. at maturity, dark, glabrous to sparsely papillate or rarely sparsely stellate at apex; seeds 2 per fruit, dark brown, broadly ellipsoid to broadly oblong-ellipsoid, at full maturity plump with one flattened side, 2.5–2.7 mm, otherwise irregularly wrinkled and shrunken, with a minutely ridged surface.

Discussion. *Dombeya ambalabeensis* has an unusual calyx morphology that is shared with only one other recognized species, *D. anakaensis*. In both taxa, the free portion of the sepal is caducous in fruit, leaving the cup of the calyx at the base of the nearly globose fruit, which retains the spreading petals. There is also a specimen from Imanombo (*Service Forestier 22510*) with similar calyx morphology that remains incertae sedis but might represent a third, herein undescribed species related to these two.

Three subspecies are recognized within *Dombeya ambalabeensis*, one of which was formerly recognized at the species level as *D. analavelonae* Arènes. *Dombeya ambalabeensis* and *D. analavelonae* have equal priority; the former is preferred because it pertains to the widespread subspecies and has been utilized far more often in the herbarium.

One specimen can be placed within *Dombeya ambalabeensis*, but not within any recognized subspecies: *Morat 4727* was collected from dry forest in northwestern Madagascar. It has very long pedicels (3.4–4.5 cm), large flowers (petals to 9 mm), and broad-based leaves with crenate-serrulate margins; the ovary is finely stellate apically. Unfortunately, it is past anthesis, and the androecia have been lost. Although this specimen was collected closest to the type locality of the poorly known *D. ambalabeensis* subsp. *ambongensis* Arènes, its morphology is entirely inconsistent with that taxon. It more closely resembles the southwestern *D. ambalabeensis* subsp. *analavelonae* (Arènes) Appleq., from which it is distinguished by its inflorescence and flower size and different ecological preferences. Placement within *D. ambalabeensis* subsp. *analavelonae* would risk obscuring the existence of a genetically distinctive northwestern subspecies; however, formal description of this population as a subspecies based on a single specimen might lead to excessive proliferation of names. Further collections of this population (if it still exists) would be highly desirable.

Specimen incertae sedis. Madagascar. **Mahajanga:** forêt de Kassife, Causse du Kelifely, forêt tropophile sur calcaire, Nov. 1974 (fr.), *Morat 4727* (MO [2]).

KEY TO THE SUBSPECIES OF *DOMBEYA AMBALABEENSIS*

1a. Ovary apically pubescent; Analavelona..... ..... 18c. subsp. *analavelonae*
1b. Ovary glabrous to papillate.
  2a. Inflorescences 2- to 7-flowered; pedicels 20–30 mm; stamens 15; staminodes 2.4–3.3 mm; ovary glabrous to papillate; southern and southwestern Madagascar..... ..... 18a. subsp. *ambalabeensis*
  2b. Inflorescences 1- or 2-flowered; pedicels 10–18 mm; stamens 10(to 15); staminodes 1.8–2 mm; ovary glabrous; northwestern Madagascar (Namoroka) .... 18b. subsp. *ambongensis*

18a. Dombeya ambalabeensis Arènes subsp. **ambalabeensis.**

Inflorescences 2- to 7-flowered; bracteole scars usually close to receptacle; pedicels 20–30 mm; petals (4.6–)6–7.5(–8) mm; stamens 15; staminodes 2.4–3.3 mm; ovary glabrous to papillate.

Distribution, habitat, and phenology. *Dombeya ambalabeensis* subsp. *ambalabeensis* is native to dry and riverine forests of southern and southwestern Madagascar; it is found on both sand and limestone at altitudes of 130–850 m. It flowers from October to December and fruits from January to May.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya ambalabeensis* subsp. *ambalabeensis* is noted as Least Concern or LC.

Vernacular names. Selinaomby (*Service Forestier 3391*), valo (*Service Forestier 4135*, *4986*), valosely (*Service Forestier 4648*).

Discussion. Leaves of *Dombeya ambalabeensis* subsp. *ambalabeensis* are reportedly caducous (*Perrier de la Bâthie 16656*) and glossy when young with veins prominent on both surfaces (*Phillipson 2499*); in dried material, the veins are not prominent.

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** "bassin de la Malio (affluent de Mangoky), près d'Ambalabe," *Humbert 19338* (P), *19360* (P); Isalo, *Keraudren 1098* (P); pk. 40, route Ihosy–Ivohibe, *Peltier & Peltier 5535* (P [2]); Ambinda, *Peltier & Peltier 5768* (P [2]); Ranohira, Ihosy, *Reserves Naturelles 10692* (P); 10 km NE of Ihosy, *Service Forestier 29067* (P [2]). **Toliara:** Ankazoabo, *Bosser 17232* (P); Zambomakondro, Sakaraha, *Decary 18924* (P); s. loc., *Homolle 1434* (MO, P [2]); Zombitsy (Sakaraha), *Humbert 29650* (P); Zombitsy, *Morat 3478* (MO, P [2]); vallée de Fiherenana, *Perrier de la Bâthie 16656* (MO, P [2]); Beza Mahafaly Reserve, parcelle 1, *Phillipson*

1726 (MO, P); Beza Mahafaly Reserve, valley of Ambinda stream, *Phillipson 2488* (MO, P); Beza Mahafaly Reserve, parcelle 1, *Phillipson 2499* (MO, P); Morafeno, Ampanihimahasoa, 12 km SE of Ankazoabo, *Randrianaivo et al. 1061* (MO, P); Hazoroa, Tulear, *Service Forestier 3391* (P); Imonty, Ankazoabe, *Service Forestier 4135* (P [2]); Anketa, Tulear, *Service Forestier 4648* (P); Hazoroa, Sakaraha, *Service Forestier 4986* (P); Beza, Bekily, *Service Forestier 11160* (MO, P [2]); Lac Ihotry [Iotry], *Service Forestier 20711* (P); Beza Mahafaly Reserve, parcelle 1, *Sussman 386* (MO); Zombitsy forest, 11 km E of Sakaraha, *Willing 35* (MO).

18b. Dombeya ambalabeensis Arènes subsp. **ambongensis** Arènes, Candollea 16: 390. 1958. TYPE: Madagascar. Mahajanga: tsingy de Namoroko (Ambongo), 1926 (fl.), [*G.*] *Petit s.n.* (holotype, P!).

Inflorescences 1- or 2-flowered; bracteole scars slightly below flower; pedicels 10–18 mm; petals 6 mm; stamens 10(to 15); staminodes 1.8–2 mm; ovary glabrous.

Distribution, habitat, and phenology. *Dombeya ambalabeensis* subsp. *ambongensis* is known only from Namoroko in northwestern Madagascar, on tsingy (limestone karst).

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya ambalabeensis* subsp. *ambongensis* is noted as Vulnerable or VU, D. Though the only known locality is protected, the fact that this plant has not been re-collected since 1926 despite many later collections made in the area suggests that the population is very small. Efforts to relocate this taxon, which may be very rare, would be desirable.

Discussion. The holotype of *Dombeya ambalabeensis* subsp. *ambongensis* was collected far outside the otherwise known range of *D. ambalabeensis*. It is, unfortunately, in poor condition, with few flowers, and the leaves are clearly immature (2–4 cm long, with 2–3 mm petioles and poorly developed venation) and severely damaged. It is distinguished from *D. ambalabeensis* subsp. *ambalabeensis* by having fewer flowers per inflorescence, smaller inflorescences, shorter staminodes, and possibly fewer stamens.

18c. Dombeya ambalabeensis Arènes subsp. **analavelonae** (Arènes) Appleq., comb. et stat. nov. Basionym: *Dombeya analavelonae* Arènes, Candollea 16: 372–373. 1958. TYPE: Madagascar. Toliara: forêt d'Analavelona (bassin du Fiherenana), forêt tropophile sur basalte, 1000–1200 m, 15–19 Dec. 1946 (post-fl.), *H. Humbert 19757* (holotype, P!; isotype, P!).

Inflorescences 2- to 5-flowered; bracteole scars from slightly below flower to immediately beneath receptacle, often separated; pedicels 20–30 mm; petals 6 mm; stamens 15; staminodes 3 mm; ovary stellate on apical portion.

Distribution, habitat, and phenology. *Dombeya ambalabeensis* subsp. *analavelonae* is endemic to Analavelona in southwestern Madagascar, on basalt at over 1000 m elevation. The massif of Analavelona has a semi-humid forest type that occurs nowhere else in the region. The type was past flowering when collected in December.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya ambalabeensis* subsp. *analavelonae* is noted as Vulnerable or VU, D. Only one population is known, and it is probably endemic to the massif of Analavelona, as no other similar habitat exists in the region. This locality is subject to less anthropogenic damage than most formally unprotected forests because of its cultural significance. However, since recent collectors have not relocated this taxon, its population is likely to be small.

Vernacular name. Selinala (in Bara dialect; *Humbert 19757*).

Discussion. The sole specimen of *Dombeya ambalabeensis* subsp. *analavelonae* known from Analavelona is distinguishable from *D. ambalabeensis* subsp. *ambalabeensis* by the sparse stellate pubescence on the immature fruit. The basal veins may be consistently more than five, and the marginal teeth of this specimen are somewhat more irregular than usual; it is otherwise unremarkable. As the massif of Analavelona represents a different habitat, with a subhumid forest that is unique in the region, this population may well be genetically distinctive.

19. Dombeya ambohitrensis Arènes, Candollea 16: 385. 1958. TYPE: Madagascar. Antsiranana: Montagne des Français, Diégo-Suarez, 24 Mar. 1955 (fl.), *Service Forestier 13137* (holotype, P!; isotypes, P [2]!, TEF not seen, TEF image!).

Tree to 9 m, DBH 13 cm; twigs dark brown, the youngest sparsely stellate with tiny trichomes or scurfy scales or papillate; stipules caducous, almost never present, deltoid, 0.5 mm, scaly or papillate; stipule scars on young twigs narrow, inconspicuous. Leaves lanceolate, occasionally to narrowly ovate, 5–9 × 1.8–3(–4) cm; petiole (4–)6–9(–10) mm, bearing small flat papillae and occasionally stellate trichomes; base rounded to oblique; apex acuminate;

margins irregularly crenate-serrulate to crenulate, with glands variably located in apices or apical margins of teeth or between teeth, occasionally protruding near apex; both surfaces papillate with tiny flat papillae or occasionally glabrate, at least sometimes stellate when young and sparse stellate indument sometimes persisting at maturity, occasionally also sparsely pilose mostly around midrib beneath; basal veins 5(to 7), the outer weak; main secondary veins above base (4)5 or 6(7) per side, visible on adaxial surface; domatia present or absent at base, if present small but often well developed, surrounded by unbranched trichomes. Inflorescences usually at least 2 per node, (3- to)6- to 10(to 14)-flowered, the largest usually umbelliform cymes with 2(3) short branches; peduncle 1.5–6 mm, papillate; pedicels 8–12(–16) mm, papillate; bracteoles very early caducous, 1 mm, ovate, papillate, at full elongation of pedicel bracteole scars well below flower, usually near the midpoint of pedicel. Sepals white, 2.4–3.8 mm, reflexed, papillate; petals white, 4–7 × 1.9–2.5 mm, narrowly obovate, mostly concave, symmetrical or nearly so; corona 0.5 mm; stamens 15; filaments 1.4–3.5(–5) mm; anthers 0.7–1.1 mm; staminodes linear to narrowly spatulate, 1.5–2.2 mm, always shorter than longest filaments; style 1.6–2.4 mm, basally glabrous; style branches two, 1–2 mm; ovary papillate. Fruit subglobose, blackish when dried, probably green in living material, 3–3.4 mm diam. at maturity, papillate; seeds 2 per fruit, possibly sometimes only 1 maturing, pale brown, broadly ellipsoid, to at least 2.3 mm, with 1 concave flattened side, surface papillate at one end and finely striated; mature seeds probably not seen.

Distribution, habitat, and phenology. *Dombeya ambohitrensis* is endemic to Montagne des Français in extreme northern Madagascar. It occurs in dry deciduous forest, at least sometimes on tsingy; the only reported altitude is 325 m. It flowers in March; fruits have been collected in May.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya ambohitrensis* is noted as Vulnerable or VU, D. This species is known to exist only at one locality, but that locality is in relatively good condition and is soon to be formally protected. The species is described as "occasional" in that area (*Razafitsalama et al. 579*), implying that the population may not be large.

Vernacular name. Sely (*Service Forestier 13137*).

Discussion. *Dombeya ambohitrensis* bears obvious affinities to the *D. subviscosa* complex. It is distinguished from *D. subviscosa* primarily by its narrower petals and papillate ovary and fruit; the ovary of *D. subviscosa* subsp. *subviscosa* is often glabrate or rarely papillate at anthesis but becomes stellate post-anthesis. The leaves of *D. ambohitrensis* are commonly lanceolate, giving it a particular resemblance to the narrow-leaved southwestern *D. subviscosa* subsp. *sakarahae* (Arènes) Appleq., but its leaf margins are usually crenate-serrulate to crenulate, whereas those of *D. subviscosa* subsp. *sakarahae* are quite variable but seldom crenulate.

Ramananjanahary et al. 27, a tree to 12 m and 20 cm DBH that is largely glabrous and lacking domatia, has relatively large fruits and flowers. The leaves sometimes have unusually long petioles, and the inflorescences are few-flowered. This might be a hybrid between *Dombeya ambohitrensis* and *D. vohemarensis*, which has, however, never been collected from Montagne des Français.

Additional specimens examined. MADAGASCAR. **Antsiranana:** Montagne des Français, *Keraudren 1613* (MO [2], P [2]), *1619* (P), *1628* (P); Montagne des Français, 5 km NE of Andranomanitra, *Razafitsalama et al. 579* (MO, P); Montagne des Français, Joffreville, *Service Forestier 3558* (P [3]).

Possible hybrid specimen. MADAGASCAR. **Antsiranana:** Andranomanitra, Montagne des Français, *Ramananjanahary et al. 27* (MO, P).

20. Dombeya anakaensis Arènes, Candollea 16: 386–387. 1958. TYPE: Madagascar. Toliara: entre Anakao et Betioky, 25 Oct. 1940 (fl.), *R. Decary 16095* (holotype, P!; isotypes, P!, TAN not seen, TAN image!).

Dombeya anakaensis subsp. *multiflora* Arènes, Candollea 16: 387. 1958, syn. nov. TYPE: Madagascar. Toliara: Vineta, Tuléar, 20 Dec. 1955 (fl.), *Service Forestier 15598* (holotype, P!; isotypes, P!, TAN not seen, TAN image!).

Shrub to 4 m or small tree to 5 m, 10 cm DBH; twigs dark brown, glabrous except for occasional small stellate patches around nodes (where buds are normally stellate); stipules caducous, lanceolate, 1.5–2.7 mm, glabrous or glabrate; stipule scars on young twigs narrow but often pale, relatively conspicuous and prominent. Leaves narrowly lanceolate to lanceolate, very rarely to ovate, 4–9.5 × 1–2.4(–3) cm; petiole 5–10(–13) mm, glabrous; base rounded to slightly cordate; apex acuminate or narrowly acute; margins irregularly crenulate-serrulate to serrulate, the teeth shallow with a long forward-pointing basal margin and short apical margin, with yellowish glands usually located in apices of teeth; young leaves papillate and sometimes

sparsely stellate, at maturity both surfaces glabrous or glabrate with minute flat papillae and rare stellate trichomes; basal veins 5(to 7), all but the inner pair weak; main secondary veins above base 3 to 6(to 9) per side with smaller similar veins sometimes interspersed, visible but inconspicuous on adaxial surface; domatia absent. Inflorescences 2- to 7-flowered, sometimes numerous and forming relatively large clusters; peduncle (0.5–)2–7.5 mm, glabrous, occasionally partly divided making the inflorescence an umbelliform cyme; pedicels (8–)10–20(–36) mm, glabrate; bracteoles rapidly caducous, irregularly oblong to lanceolate, 1–1.2 mm, with papillate margins, scars borne immediately beneath flower (or slightly lowered). Sepals basally fused, the free portions (2–)3.3–3.8(–4.2) mm, almost always reflexed and sometimes displaying relatively large and conspicuous glandular patches, caducous in fruit and the basal cup remaining, glabrous with rare stellate patches as an aberration in individual flowers; petals white with a dark red basal mark, (4.3–)4.8–6.4(–7.6) × (2–)2.7–3.7(–4.3) mm, elliptical to obovate, slightly asymmetrical, mostly concave; corona (1–)1.3–2(–2.6) mm; stamens 15; filaments 0.5–2.4(–3) mm; anthers 0.7–1.2 mm; staminodes narrowly spatulate to linear, (1.5–)2.2–3 mm; style (2.6–)3.3–5.6 mm; style branches two, 0.6–0.8(–1) mm; ovary papillate. Fruit subglobose, often with a persistent style base, 3.5–4 mm diam. at maturity, dark, inconspicuously papillate; seeds 1 or 2 per fruit, dark brown, 2–2.6 mm, if 1 then irregularly shaped and not compressed, if 2 then broadly obovoid with 1 concave flattened side, nearly hemispherical, surface slightly papillate or minutely ridged.

Distribution, habitat, and phenology. *Dombeya anakaensis* is native to dry forest and bush of southwestern Madagascar, ranging as far north as Morondava on the western coast; it is reported on limestone, including tsingy, and red soil at altitudes of 30–350 m. It flowers from October to March and fruits from February to March.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya anakaensis* is noted as Least Concern or LC.

Vernacular names. Ampelambatotse (*Service Forestier 15598*), satro (*Humbert 20192*), sely (*Rahantamalala 58*), valo (*Service Forestier 4516*).

Discussion. *Dombeya anakaensis* is clearly a close relative of *D. ambalabeensis*, with which it shares an unusual calyx morphology, particularly in fruit. *Dombeya anakaensis* can be distinguished by its often narrowly lanceolate leaves with more strongly serrulate, shallow but elongated teeth, and by the lack of stellate pubescence in the mature plant. The petals are on average slightly smaller, and the bracteoles have papillate rather than long-pubescent margins (however, as the bracteoles remain only on the tiniest buds, this character will seldom be available for observation). Existing collections describe *D. anakaensis* as a small tree or shrub, whereas *D. ambalabeensis* sometimes grows to large size (10–12 m, or in one report 20 m).

Leaves of *Dombeya anakaensis* are described as subcoriaceous (*Du Puy et al. MB622*). Two collections from Morondava (*Nicoll 165* and *Rahantamalala 58*), well north of the usual range, have very long pedicels and ovate or near-ovate leaves with very rounded, sometimes ill-defined teeth. However, their leaf morphology is not more extreme than that of two other specimens (mentioned below) from the Tulear region that are herein identified as *D. anakaensis*, and other characters are typical. Identity of this population may be questionable.

Two collections are believed to be hybrids of *Dombeya ambalabeensis* × *D. anakaensis*. *Chauvet 369* is glabrous but has very broad leaves with highly aberrant marginal teeth; *Phillipson & Rabesihanaka 3104* has narrow leaves but stellate pubescence especially on the leaves and petioles. Both come from a region where both putative parental species are to be found, and given the undoubted close relationship between the two species, cross-fertility would not be unlikely. A few other unusually broad-leaved but otherwise typical specimens are herein identified as *D. anakaensis*; in addition to the material from Morondova (above), two were collected along the road from Tulear to Sakaraha (*Service Forestier 511* and *20192*), again in the region of sympatry. It is tempting to identify these as possibly part of a hybrid zone as well; however, it is also possible that the limited available material of *D. anakaensis* does not adequately reflect the range of variation typical of mature leaves in this species.

Additional specimens examined. MADAGASCAR. **Toliara:** Atsimo-Andrefana, Belalanda, Ranobe, *Andrianjafy et al. 1689* (MO); Km. 25,500, rte. from Tuléar to Tana, *Chauvet 130* (MO, P); 45–55 km E of Tulear on rd. to Andranovory, *Croat 31073* (MO); Tanety Miary, *Dequaire 27507* (MO, P); ca. 50 km W of Ampanihy on rte. to Androka, NE of Vangiambato, *Du Puy et al. MB622* (MO, P); valley of the Onilahy near Tongobory, Ranomay, *Humbert 20192* (MO, P); plateau Mahafaly, 3 km from village of Beomby (W of Edjeda), *Keraudren 815* (P [2]); 53 km SW of Ampanihy, *Labat et al. 2089* (P); 45 km N of Morondava on Belo Tsiribihina rd., 20°03′S, 044°38′E, *Nicoll 165* (MO, P); Ambatoveve, Betioky, *Peltier & Peltier 1357* (MO, P); Morondava, *Rahantamalala 58* (P); Atsimo-

Andrefana, Belalanda, Ranobe, *Razafindraibe et al. 179* (MO); gorges of the Fiherenana, Tulear, *Service Forestier (Chauvet) 369* (MO [2]); rte. Tulear–Sakaraha (Km. 26), *Service Forestier 511* (P); Ambohimalaha, Velona, Tuléar, *Service Forestier 4516* (P); rte. Tuléar–Sakaraha, *Service Forestier 20192* (MO, P); N of Andranohinaly (PK 45, rte. Tuléar–Sakaraha), *Service Forestier 20762* (P).

Hybrid specimens. MADAGASCAR. **Toliara:** gorge of the Fiherenana, Tuléar, *Chauwet 369* (P [12]); valley of the Fiherenana, near Beantsy, *Phillipson & Rabesihanaka 3104* (MO, P).

21. Dombeya danguyi Hochr., Candollea 3: 39–40. 1926. TYPE: Madagascar. Toliara: distr. d'Ambovombe [Androy], sable [sand], 14 Apr. 1924 (fl.), *R. Decary 2632* (holotype, P!; isotypes, G not seen, G image!, MO!, P!).

Shrub or small tree; twigs dark to grayish brown, the youngest glabrous or bearing minute white scales or flattened papillae; stipules caducous, broadly deltoid, 0.5–1 mm, papillate; stipule scars on young twigs narrow, usually inconspicuous, occasionally pale and relatively conspicuous. Leaves narrowly lanceolate or occasionally lanceolate, 4.5–10 × 0.8–2.4 cm; petiole 5–14(–20) mm, papillate to glabrate; base moderately oblique to rounded, with basal insertion usually asymmetrical; apex narrowly acute, often asymmetrically, to acuminate; margins shallowly to conspicuously crenate-denticulate to crenate-dentate, crenate-serrulate, or shallowly wavy, with pale or brownish glands usually located in apical margin of teeth or in tooth apices; both surfaces usually at least sparsely papillate with small flat papillae, rarely glabrate, the upper surface grayish olive-green; basal veins (3 to)5(to 7), all but the innermost weak; main secondary veins above base 7 to 12 per side, usually visible on adaxial surface, often dark-colored; domatia absent. Inflorescences 1- to 4(5)-flowered, frequently an umbelliform cyme with ± divided peduncle; peduncle 1–6(–8) mm, papillate or bearing small white scales or rarely glabrous; pedicels (5–)10–20(–23) mm, at least sparsely papillate or scaly; bracteoles broadly ovate, 0.5 mm, borne immediately below flower, very rapidly caducous. Sepals 4–5.5(–6) mm, usually but not always reflexed, papillate or bearing small white scales; petals white, 7–9.5 × 2.8–4.6(–5) mm, elliptical to obovate, symmetrical or slightly asymmetrical, mostly concave in fruit; corona 1–1.4 mm; stamens 10; filaments 1.4–5 mm, sometimes irregularly fused above corona; anthers 1–1.4 mm; staminodes linear, 3–3.5 mm; style 2.4–4 mm; style branches two, 1.6–2 mm; ovary stellate, occasionally glabrous basally. Fruit subglobose, laterally compressed, 4–5 mm diam., densely stellate; seeds 2 per fruit, dark brown, broadly elliptical with 1 flattened side, 2.2–2.3 mm, irregularly shaped with few prominent ridges, surface finely striated.

Distribution, habitat, and phenology. *Dombeya danguyi* occurs in the region of Ambovombe in southwestern Madagascar on sand. Flowering collections are known from April and June and fruits from August.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya danguyi* is noted as Endangered or EN B1ab(iii)+2ab(iii). The three known collections are all from a small and unprotected area, if not from the same population; considerable habitat degradation has occurred since these collections were made.

Vernacular name. Vala (*Service Forestier 15661*).

Discussion. *Dombeya danguyi* is probably closely related to the *D. subviscosa* complex and bears a strong resemblance to *D. subviscosa* subsp. *sakarahae*; it can be distinguished from that taxon by its slightly larger flowers, with only 10 stamens and bracteole scars immediately beneath the flower rather than well below it. The buds of *D. danguyi* have an unusual elongated ellipsoid or nearly cylindrical shape, with an abruptly narrowed apex, whereas those of the *D. subviscosa* complex, like those of most species of *Dombeya* sect. *Decastemon*, are broadly ellipsoid to broadly obovoid. Another southern species with sometimes narrowly lanceolate and somewhat oblique leaves, *D. selinala*, is distinguished by stellate indument on several parts, shorter petioles, bracteole scars well beneath the flower with the pedicel sometimes thickened above, and somewhat smaller flowers with a prominent elongated corona and 15 stamens.

The flower of *Dombeya danguyi* is said to have an odor of hawthorn (*Decary 2632*).

Additional specimens examined. MADAGASCAR. **Toliara:** Ampasimpolaka, E of Ambovombe, *Decary 9049* (MO, P [2]); Sampana, Ambovombe, *Service Forestier 15661* (P [2]).

22. Dombeya digyna Hochr., Candollea 3: 33–34. 1926. TYPE: Madagascar. Mahajanga: bois, bassin du Mahajamba (Boëny), Sep. 1906 (fl.), *H. Perrier de la Bâthie 5536* (lectotype, designated by Arènes [1958: 370], P!; isolectotypes, G not seen, G image!, K not seen, K image!).

Tree to 15 m or shrub with brownish rough bark; twigs grayish to dark brown, the youngest stellate;

stipules caducous, subulate with a broad base, 2–3.6 mm, glabrate to sparsely scurfy-stellate; stipule scars on young twigs narrow, relatively long and dark. Leaves lanceolate to ovate or narrowly lanceolate, (4–)5–9.2 × (1.3–)1.8–3.4(–4) cm; petiole (2–)5–11 mm, stellate; base rounded to oblique; apex acuminate or rarely acute; margins serrulate to crenulate, with brownish glands usually located at apices of teeth; abaxial surface sparsely stellate at least along main veins, adaxial surface sparsely stellate to glabrate usually with tiny flat papillae; basal veins 5 (very rarely 3), the outer pair weak; secondary veins above base 5 to 7 per side, visible on adaxial surface, very prominent on adaxial surface; domatia usually inconspicuous but present on most large leaves in one or more pairs of secondary vein axils and often at base, those at base usually simple small hollows in vein axils, those borne in secondary vein axils also small but frequently covered, rarely domatia absent but unusually deep hollows present in vein axils. Inflorescences 2- to 4(to 8)-flowered, the larger usually an umbelliform cyme with divided peduncle, sometimes numerous and forming relatively large clusters; peduncle 2–7 mm, stellate; pedicels 5–12 mm, stellate; bracteoles caducous, occasionally persisting to anthesis, broadly oblong-elliptical to ovate or orbicular, 1.2–1.7 mm, stellate, borne immediately to slightly beneath flower. Sepals 3.2–5 mm, usually reflexed in full flower, stellate to sparsely stellate; petals 7.5–9 × 4.2–6(–6.5) mm, obovate, slightly asymmetrical to nearly symmetrical, becoming somewhat concave; corona 1–1.5 mm; stamens 15; filaments 2–3.5 mm, generally not fused above corona; anthers 0.9–1.2 mm; staminodes narrowly spatulate, 2.5–3.5 mm; style 3–4.5 mm, sparsely stellate or glabrous; style branches 2(3), 1–1.6 mm; ovary stellate. Developing fruit subglobose, possibly losing much of its indument during maturation, to 5 mm diam.

Distribution, habitat, and phenology. *Dombeya digyna* is native to dry forests on sandy soil in northwestern Madagascar; the only reported altitude is 1100–1200 m, but most localities were probably at lower altitudes. Flowering collections are known from September, February, and April and a fruiting collection from May.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya digyna* is noted as Endangered or EN B2ab(iii). Only four locations are known, none in protected areas; continued habitat degradation has been occurring in these areas, and the most recent collection is almost 40 years old.

Vernacular name. Mabolotsaka (*Service Forestier 16370*; Sakalava dialect).

Discussion. *Dombeya digyna* is distinguished from *D. tulearensis* by its somewhat longer, reliably lanceolate and acuminate leaves (whereas the so-called acuminate leaves of *D. tulearensis* have much shorter apices) and stellate ovary; the corolla is on average slightly larger, and the filaments seem to be usually free above the corona. *Dombeya digyna* also resembles *D. subviscosa* subsp. *subviscosa*, from which it may be distinguished by its more consistently and strongly stellate indument on most parts, most importantly on the sepals; additionally, *D. subviscosa* subsp. *subviscosa* usually has crenate to crenulate (though variable) leaf margins, more flowers per inflorescence, longer pedicels, and slightly smaller flowers. The limited number of collections have a broad and perhaps suspicious geographic range (that farthest to the northeast, *Gentry 11758*, was a 15 m tree, whereas that farthest to the southwest, *Service Forestier 16370*, which has very narrow leaves with prominent domatia, was a 3 m shrub). However, the existing specimens all certainly form a natural group within which it is not possible to formally recognize geographic variation, given the limited available material.

As for several other taxa (see discussion under *Dombeya aquifoliopsis*), *D. digyna* was lectotypified by Arènes (1958), who chose the P duplicate of *Perrier de la Bâthie 5536* as the type. Hochreutiner (1926) cited only the G duplicate of *Perrier de la Bâthie 5536* (no other herbarium was mentioned, and the detailed label data quoted are those of the G duplicate) and the P duplicate of *Perrier de la Bâthie 594*. Article 9.12 of the ICN (McNeill et al., 2012) implies that the cited syntype should have been chosen as lectotype in preference to an isosyntype but does not explicitly make this obligatory.

Dombeya digyna is said to have semi-soft wood used for fencing and bark with a little fiber (*Service Forestier 16370*).

Additional specimens examined. MADAGASCAR. **Mahajanga:** rd. from Antsohihy to Bealanana, 17–19 km E of Antsahabe, *Gentry 11758* (MO, P); Firingalava, *Perrier de la Bâthie 594* (P [7]); Ampandra, canton Maintirano, *Service Forestier 16370* (P [3]).

23. Dombeya micrantha Appleq., sp. nov. TYPE: Madagascar. Toamasina: Menaloha, 1952–1955 (fl.), *J. Déquaire 27753* (holotype, P!). Figure 4.

Diagnosis. Distinguished from *Dombeya subviscosa* Hochr. complex by domatia in axils of lateral veins, midrib sometimes appearing slightly sympodially branched; small-

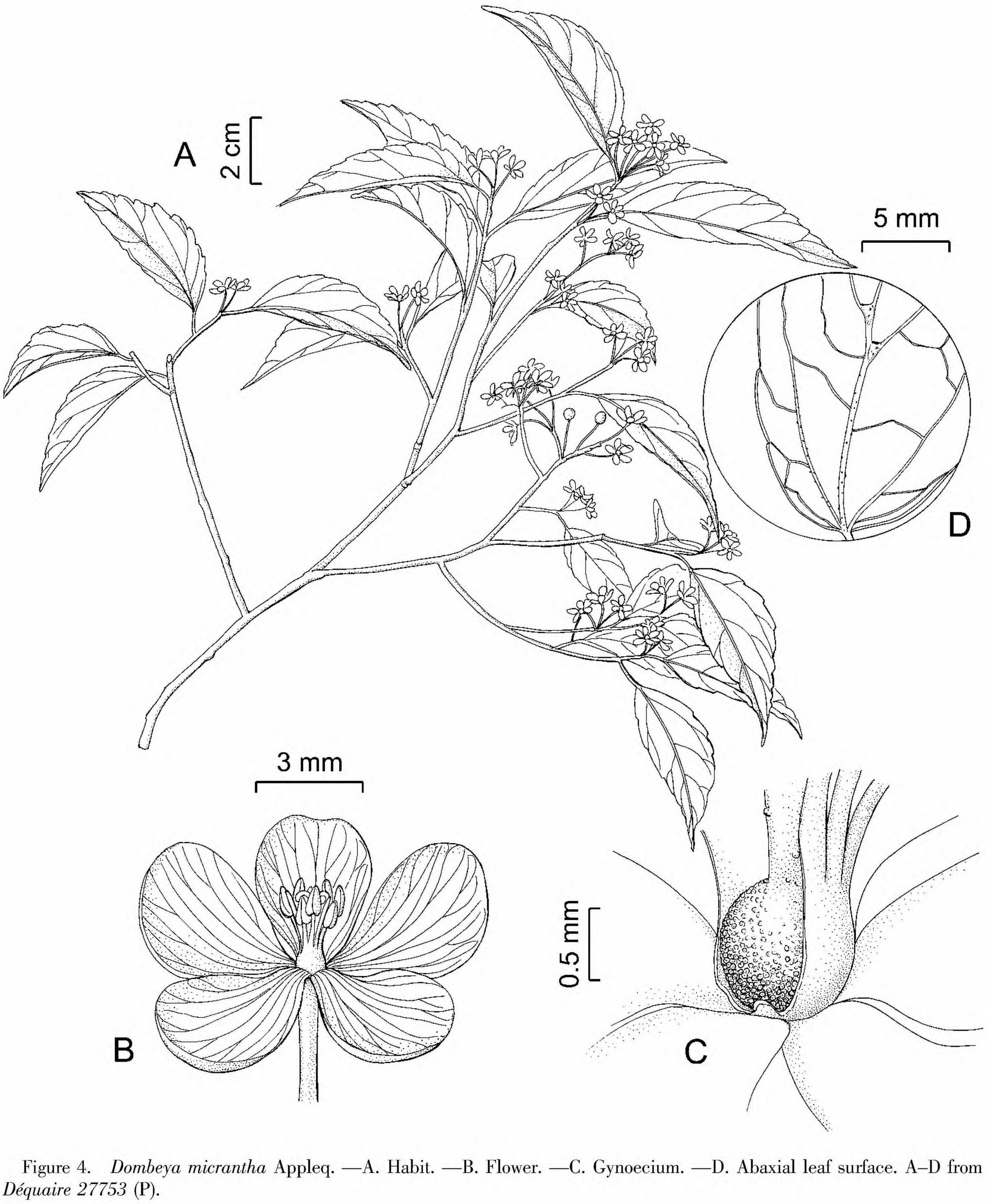


Figure 4. *Dombeya micrantha* Appleq. —A. Habit. —B. Flower. —C. Gynoecium. —D. Abaxial leaf surface. A–D from *Déquaire 27753* (P).

er flowers, with petals < 5 mm; ovary papillate, possibly becoming glabrate or glabrous after anthesis.

Tree to 10 m with grayish bark; twigs dark brown, the youngest sparsely papillate to glabrate; stipules caducous, not seen; stipule scars on young twigs narrow, inconspicuous. Leaves lanceolate, 5–7 × 1.4–2.4 cm; petiole 6–11 mm, papillate; base rounded to short-attenuate; apex acuminate, often somewhat asymmetrical; margins serrate to serrulate or crenate-serrate, with glands usually in or near tooth apices; both surfaces sparsely papillate with papillae tiny, flat, often reddish; basal veins 5(to 7), the outer weak, the inner often joining midrib well above base and running parallel to midrib rather than fusing with it; secondary veins above the base, 3 or 4 per side, slightly prominent and relatively conspicuous on both surfaces; domatia present, usually swollen and conspicuous, absent at base but present

in axils of secondary veins, the midrib sometimes having a slightly zigzag appearance and possibly sympodially branched, and also often in axils of first large tertiary veins branching from the basal veins. Inflorescences 2- to 5-flowered, sometimes borne 2 per node; peduncle 0.6–2 mm, sparsely papillate with rare single fimbriate scales; pedicels 6.5–11 mm, sparsely papillate especially above bracteole scars; bracteoles caducous, not seen, borne below midpoint of pedicel. Sepals 2.1–2.7 mm, reflexed, papillate; petals white, (3.2–)3.8–4.4 × (2–)2.4–2.8 mm, obovate, usually strongly convex at anthesis, nearly symmetrical; corona 0.6–1 mm, sometimes narrowed above ovary and slightly reflexed; stamens 10; filaments 0.5–1.6 mm, partly fused above corona; anthers yellow, 0.6–0.8 mm; staminodes linear, 1.3–2 mm; style 1.5–1.8 mm, glabrous; style branches 2, ca. 1 mm; ovary densely papillate, with indument possibly lost rapidly at least apically after flowering. Fruit not seen.

Distribution and habitat. *Dombeya micrantha* is from humid forest in the vicinity of Menaloha in eastern Madagascar.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya micrantha* is noted as Critically Endangered or CR B1ab(iii)-2ab(iii). The type locality is near Lac Alaotra and Ambatondrazaka; the region is relatively accessible and has been the source of numerous botanical collections. The fact that this species has not been recollected in over 50 years, therefore, indicates that it is quite rare.

Discussion. The affinities of *Dombeya micrantha* are uncertain. The new species is distinguished by the domatia located in axils of secondary veins and the sometimes slightly zigzag appearance of the midrib, very small flowers with petals under 5 mm, and a papillate ovary (a character not totally unknown in related species, but less common than stellate pubescence). Its strongly convex petals demonstrate that it belongs within *Dombeya* ser. *Selinala*, but it is ecologically distinctive within that series, being the only species from eastern humid forest, while all other species are native to dry seasonal western or southern forests and bush or the extreme north. It is, therefore, not plausible to hypothesize that the type is a hybrid involving another species of *Dombeya* ser. *Selinala*.

24. Dombeya parvipetala Arènes, Candollea 16: 407. 1958. TYPE: Madagascar. Toliara: Ambovombe, 3 Feb. 1931 (fl.), *R. Decary 8478* (holotype, P!; isotype, PRE not seen, PRE image!).

Shrub to 7 m or small tree; twigs pale gray, the youngest bearing small yellowish papillae; stipule scars on young twigs small, narrow to narrowly crescent-shaped, not prominent or sometimes slightly raised by outgrowth of bark proximally. Leaves narrowly lanceolate, 4.8–11 × 0.9–2.7(–3.3) cm; petiole 7–15 mm, minutely papillate; stipules caducous, narrowly lanceolate, 1.7–2.5 mm, sparsely papillate; base rounded; apex acuminate with a rounded tip; margins shallowly wavy (especially when young) or with few crenate-serrate, rounded teeth in basal part, occasionally developed into small lobes, glands often prominent toward base, absent or inconspicuous apically, located in shallow marginal concavities or in tooth or lobe apices; both surfaces sparsely flat-papillate, especially the abaxial; basal veins 5(to 7), the outer weak; main secondary veins above base 2 to 4 per side with numerous slightly smaller veins interspersed, mainly reticulodromous toward apex, visible on adaxial surface; domatia absent. Inflorescences many-flowered or less often few-flowered cymes, ± dichotomously or seldom trichotomously branched with (2)3 or 4 orders of branching, the ultimate branching sometimes umbellate with up to 7 flowers, sometimes most flowers deciduous; peduncle 0.9–3.2 cm, sparsely papillate; pedicels 3.5–9 mm, sparsely papillate; bracteoles rapidly caducous, elliptical or irregularly shaped, 0.4–0.7 mm, with sometimes papillate margins, the bracteole scars at flowering at about midpoint of pedicel or lower. Sepals (2–)2.5–3.4 mm, not reflexed, sparsely flat-papillate mostly on the lower portion, bearing large conspicuous glandular patches; petals white, 3–4.3 × 1.9–2.5 mm, obovate, slightly asymmetrical to nearly symmetrical; corona (0.5–)0.9–1.5 mm; stamens 10; filaments 0.4–1.8 mm; anthers 0.7–1.1 mm; staminodes narrowly spatulate to ligulate, 1.7–2.3 mm; style 1.7–3 mm, glabrous or with few stellate trichomes at base; style branches 2 or 3(4), 0.5–1 mm; ovary stellate with small flattish white trichomes. Fruit ellipsoid, shallowly ribbed, with a persistent style base, 3.2–4 mm high at maturity, finely white-stellate; seeds 1 per fruit, dark to reddish brown, irregularly ellipsoid, somewhat 3-sided or 4-lobed, 2.4–2.5 mm.

Distribution, habitat, and phenology. *Dombeya parvipetala* is native to southwestern and extreme southern Madagascar on sand. It flowers in January through March and fruits in February and March.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya parvipetala* is noted as Endangered or EN B2ab(iii). No more than five clearly separate populations have been collected; the habitat has been subject to severe degradation, and the most recent collection (*Croat 31525*) dates to 1975.

Vernacular name. Vala (*Decary s.n.*; *Service Forestier 4535*, *14316*).

Discussion. *Dombeya parvipetala* is distinguished from most species of *Dombeya* sect. *Decastemon* by its small but consistently cymose inflorescences; it was placed by Arènes (1958) within *Dombeya* sect. *Xeropetalum*. Although no molecular data to show its affinities are available, by overall morphology this species seems to be better placed within *Dombeya* sect. *Decastemon*. Features otherwise not found within *Dombeya* sect. *Xeropetalum* include the narrowly lanceolate, acuminate leaves, solely papillate indument on all vegetative parts, nearly symmetrical petals, and staminodes that, though longer than the filaments, are shorter than the fertile stamens. Other notable features that would be very unusual in *Dombeya* sect. *Xeropetalum* include prominent leaf marginal glands and bracteole scars very low on the pedicel, as well as the relatively symmetrical inflorescence branching noted earlier.

Dombeya parvipetala is placed within *Dombeya* ser. *Selinala* because its petals are nearly symmetrical and convex, although they are unusually broad and thin textured and usually rolled or crumpled so that the tendency toward convexity is hard to see in exsiccatae. This placement is supported by other features, such as the narrowly lanceolate leaves and the unusually large and conspicuous glandular patches on the sepals, a character that is otherwise seen, in this section, only in three species of *Dombeya* ser. *Selinala* (*D. ambalabeensis*, *D. anakaensis*, and *D. sakamaliensis*). Young material of *D. parvipetala* is described as resinous (*Service Forestier 22533*).

Additional specimens examined. MADAGASCAR. **Toliara:** 1–30 km S of Beloha along road to Lavanono, *Croat 31525* (MO, P); Beloha, *Decary s.n.* (P), *Decary s.n.* (P); Ambovombe, *Decary 3505* (P), *3513* (P), *8498* (P); Jafaro–Antanimora, *Service Forestier 4535* (P [2]); Ampira–Ambovombe, *Service Forestier 14316* (MO, P [3]); forest of Analamatahitse (Analamatahotra) between Bekily and the Beraketa–Antanimora rte., *Service Forestier 22533* (MO [2], P [3]); banks of the Sakatomily E of Tsihombe, *Service Forestier 22541* (P).

25. Dombeya sakamaliensis Arènes, Candollea 16: 369. 1958. TYPE: Madagascar. Toliara: vallée de la Sakamalio, affluent de la Manambolo (bassin du Mandrare), pentes rocailleuses (gneiss), bush xérophile, 500–800 m, Dec. 1933 (fl.), *H. Humbert 13318* (holotype, P!).

Small tree; twigs dark brown, the youngest sparsely stellate; stipules caducous, lanceolate, 3 mm, sparsely stellate; stipule scars on young twigs narrow and inconspicuous. Leaves lanceolate to narrowly ovate, 6.3–9 × 2.7–3.8 cm; petiole 6–10 mm, densely stellate in young leaves, becoming sparsely stellate; base ± rounded, tending toward rounded-truncate or very slightly cordate; apex acuminate, often curving, the immediate tip rounded, or rarely acute; margins irregularly crenate-serrate, with inconspicuous glands usually in tooth apices; both surfaces sparsely stellate and bearing tiny flat papillae; basal veins 5 to 7, all but the inner pair weak; main secondary veins above base 5 to 7(to 10) per side, visible but not conspicuous on adaxial surface; domatia absent. Inflorescences 9- or 10-flowered; peduncles 3–7 mm, stellate, paired in leaf axils or divided at base, further branching in an umbelliform fashion at the apex so that a small section of peduncle may support the base of each individual pedicel; pedicels 15–19 mm, glabrate with few stellate trichomes often near base; bracteoles rapidly caducous, roughly oblong, sometimes thickened, 0.8–1 mm, stellate, at maturity bracteole scars somewhat below flower and separated from one another on pedicel. Sepals 4–5.5 mm, reflexed, papillate, with large glandular patches; petals white, 7.5–8.4 × 3.3–4 mm, obovate, strongly reflexed in flower, slightly asymmetrical, somewhat concave; corona 2.5–3.7 mm; stamens 15; filaments 0.4–1.8 mm; anthers 1–1.5 mm; staminodes linear, 2.5–3.4 mm; style 5.2–5.5(–6) mm; style branches 2, ca. 1.5 mm; ovary stellate.

Distribution, habitat, and phenology. *Dombeya sakamaliensis* has been collected in dry brush on gneiss near the Sakamalio River in southeastern Madagascar, at a reported altitude of 500–800 m; it flowers in December.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya sakamaliensis* is noted as Data Deficient or DD. Although it is known only from the type collection, botanical specimens from the area of the Mandrare River basin are quite scarce, except for Humbert's collections. Habitat quality and population status are therefore unknown.

Discussion. *Dombeya sakamaliensis* bears a strong resemblance to *D. ambalabeensis*. It is distinguished by its unusual inflorescences with

multibranched peduncles, strongly reflexed corollas, elongated pedicel above the bracteoles, and slightly larger flowers; the leaf shape and stellate ovary would also be unusual for *D. ambalabeensis*. The sepals are reflexed abruptly, rather than in a curve; since the only known specimen is at anthesis, it is unknown whether the sepals are caducous as in *D. ambalabeensis* and *D. anakaensis*. Since only one specimen exists, the possibility should be considered that it is a hybrid involving *D. ambalabeensis*; however, a second parent native to southern Madagascar that would explain the observed suite of morphological characters has not been identified.

26. Dombeya selinala Arènes, Candollea 16: 371–372. 1958. TYPE: Madagascar. Toliara: vallée moyenne du Mandrare près d'Anadabolava, forêt sèche, 200–250 m, Dec. 1933 (fl.), *H. Humbert 12512* (holotype, P!; isotypes, K not seen, K image!, MO [3]!, P!).

Dombeya cloiselii Arènes, Candollea 16: 374. 1958, syn. nov. TYPE: Madagascar. Anosy [Toliara]: Fort Dauphin, s.d., (fl.), *J. Cloisel 49* (holotype, P!).

Dombeya valafotsy Arènes, Candollea 16: 388. 1958, syn. nov. TYPE: Madagascar. Toliara: RN XI [Andohahela], distr. Fort Dauphin, forêt sèche, 7 Feb. 1951 (fl.), *Reserves Naturelles 2758* (holotype, P!; isotypes, MO!, P!).

Dombeya vohitsiombeensis Arènes, Candollea 16: 373. 1958, syn. nov. TYPE: Madagascar. Toliara: massif du Vohitsiombe, prov. Fort Dauphin, 31 July 1926 (fl.), *R. Decary 4660* (holotype, P!; isotypes, MO!, P!).

Shrub to 4 m or tree to 8 m; twigs dark brown, the youngest stellate with small white trichomes; stipules caducous, lanceolate, 1.4–2.4 mm, stellate; stipule scars on young twigs narrow, small, usually relatively inconspicuous. Leaves lanceolate to narrowly lanceolate or rarely narrowly ovate, (2.7–)4–8.1 × (0.9–)1.2–2.1(–3.2) cm; petiole 1.8–7 mm, stellate; base rounded, sometimes slightly oblique, rarely barely cordate; apex acuminate to acute; margins irregularly crenulate-serrulate to serrulate with brownish glands usually located at apices of teeth; both surfaces sparsely stellate to glabrate or occasionally papillate with small flat papillae; basal veins 5, the outer weak; secondary veins above base (4)5 to 7 per side, usually inconspicuous but visible on adaxial surface; domatia absent. Inflorescences 1- to 6(to 8)-flowered, sometimes an umbelliform cyme with divided peduncle, often numerous and forming relatively large clusters; peduncle 1.5–7 mm, stellate or rarely glabrous; pedicels (8–)12–20(–22) mm, glabrate with very few stellate trichomes basally or glabrous or occasionally papillate; bracteoles borne well below flower with pedicel sometimes thickened above bracteole scars, very rapidly caducous, oblong or ovate, 0.5–1 mm, stellate. Sepals (2.5–)3–4 mm, reflexed or not in flower, always reflexed in fruit, papillate to glabrous; petals white, (4.5–)5–6.3 × 2–3.3(–3.8) mm, elliptical, symmetrical, often strongly concave in fruit; corona (1.4–)2–2.6 mm, often erect and prominent in flower; stamens 15; filaments 0.5–1.5 mm, sometimes irregularly fused above corona; anthers yellow, 0.8–1.1 mm; staminodes narrowly spatulate, 1.8–2.4(–3) mm; style (3–)4–5.5 mm; style branches two, 0.7–1.1 mm; ovary stellate apically or glabrous. Fruit subglobose with a narrowed apex, slightly laterally compressed, 2.3–3.5 mm diam., dark brown with sparse stellate indument persisting when present on ovary; seeds 1 or 2 per fruit, dark brown, broadly oblong-elliptical to oblong-ovate, ± laterally compressed, irregularly shaped or with one side concave, 2–2.4 mm, mature seeds possibly not seen.

Distribution, habitat, and phenology. *Dombeya selinala* is native to dry forest, bush, and transitional forests in southeastern Madagascar; it has been reported to occur on gneiss, granite, laterite, and alluvial substrates at altitudes from 200 to over 500 m. Label data for the collection *Leandri 4430* give an altitude range of 400–1900 m, but no other specimen lists a maximum altitude over 800 m, so this collection is presumed to have been made in the lower part of that range. The species flowers from September through February (once in July); fruits, usually immature, are collected from December through May.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya selinala* is noted as Least Concern or LC.

Vernacular names. Androfiary (*Reserves Naturelles 6202*), lipaty (*Reserves Naturelles 8355*), seliala (*Humbert 13813* [dialect Antanosy]), selinala (*Humbert 12512*), vala (*Reserves Naturelles 2123*, *2674*, *6753*), valafotsy (*Reserves Naturelles 2758*), valomainty (*Reserves Naturelles 6209*).

Discussion. *Dombeya selinala* and *D. valafotsy* were placed in different series in Arènes' (1958) classification. The two species were distinguished largely on the observation that the former has partly stellate ovaries, while the latter has glabrous ovaries. The two are otherwise indistinguishable. The six glabrous-ovaried collections known for *D. valafotsy* represent most, but not all, of the material collected from the Andohahela area. These two names must be synonymized, and *D. selinala* is preferred because the stellate-ovaried type better reflects the common state of that character over the species' entire range. *Dombeya cloiselii* and *D. vohitsiombeensis* are each

known only from the type. Both represent poorly developed individuals of *D. selinala*; the type of *D. vohitsiombeensis* has tiny leaves, apparently due to immaturity of the specimen. Flowers of *D. selinala* are described as having a "fine" odor (*Humbert 12512*).

Additional specimens examined. MADAGASCAR. **Toliara:** Mandrare, Beza Esiva, *Descoings 2742* (MO); Andohahela RNI, Ranopiso, Mahamavo, *Eboroke 797* (MO, P); "vallée de la Sakamalio, affluent de la Manambolo," *Humbert 13331* (MO, P [2]); mont Apiky, *Humbert 13813* (MO, P [2]); Mont Vohitrandriana S of Ranopiso, *Humbert 29138* (MO, P); middle Mandrare, Anadabolava, *Keraudren 1539* (P); "haut bassin de la Mananara et abords" (SE), N d'Imonty, *Leandri 4430* (P); Anosy, Fort-Dauphin, Ankoba, *Randrianaivo et al. 1718* (MO); Anosy, Fort-Dauphin, 2.5 km E Dimonty, *Ratovoson 1544* (MO); Imonty, Behara, Androy, *Reserves Naturelles 2123* (MO [2], P [3]); Imonty, Behara, *Reserves Naturelles 2674* (P [3]); Behara, Androy, Andohahela, *Reserves Naturelles 6202* (MO, P), *6209* (MO, P [2]); Behara, Androy, *Reserves Naturelles 6753* (MO, P); Behara, Amboasary, *Reserves Naturelles 8355* (MO, P); Imonty, near Andohahela, *Service Forestier 8531* (MO, P); massif of Vohitsiandriana, N of Cap Andrahomana, *Service Forestier 11834* (MO, P [2]).

27. Dombeya sely Arènes, Candollea 16: 379–380. 1958. TYPE: Madagascar. Mahajanga: Antsingy [Bemaraha RNI], Maintirano, 24 Apr. 1952 (fl.), *Service Forestier 5276* (holotype, P!; isotypes, P [2]!, TAN not seen, TAN image!, TEF not seen, TEF image!).

Woody plant; twigs grayish, the youngest stellate with very small scurfy trichomes; stipules lanceolate, 1.5 mm, stellate; stipule scars on young twigs narrow, inconspicuous. Leaves narrowly lanceolate to lanceolate, 3.5–5.5 × 1–1.5 cm; petiole 4–8 mm, stellate; base oblique to rounded; apex acuminate or narrowly acute; margins very shallowly serrulate to crenulate or subentire, with brownish glands located at apices of teeth; both surfaces sparsely stellate especially along main veins; basal veins 5, the outer pair weak; secondary veins above base (4)5 to 7 per side, visible on adaxial surface; domatia present on most large leaves in 2 or 3 pairs of secondary vein axils and at base. Inflorescences (1)2- or 3-flowered, often grouped in small clusters; peduncle 1–3.5 mm, stellate; pedicels 5.5–9 mm, stellate or sparsely stellate and bearing small reddish glandular papillae; bracteoles caducous, not seen, borne immediately beneath flower. Sepals 4–5 mm, reflexed, bearing small reddish glandular papillae; petals 7–8 × 3–4 mm, obovate, nearly symmetrical, concave; corona 1.5 mm, narrowed above ovary; stamens 15; filaments 2–3.5 mm, generally not fused above corona; anthers 1–1.2 mm; staminodes linear, 3–4 mm; style 4 mm, glabrous; style branches two, 1 mm; ovary densely papillate with papillae probably being lost after anthesis.

Distribution, habitat, and phenology. *Dombeya sely* is native to the vicinity of Maintirano in northwestern Madagascar; it flowers in April.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya sely* is noted as Vulnerable or VU, D. The only known locality is protected; no collections other than the type have been made, indicating that it is likely to be rare.

Vernacular name. Sely (*Service Forestier 5276*).

Discussion. *Dombeya sely* shares many characters in common with *D. digyna*, with which it co-occurs in the Maintirano region. It is distinguished by its smaller and proportionately narrower leaves (though it is possible that none of the leaves on the type collection are of mature size), somewhat smaller inflorescences with shorter peduncles, narrower petals, staminodes longer than the filaments, and a densely papillate rather than stellate ovary. *Dombeya sely* is distinguished from *D. subviscosa* subsp. *subviscosa*, the most common northwestern taxon in this section, by its small narrow leaves, staminodes exceeding the filaments, longer corona that is narrowed above the ovary, longer style, and stellate indument (which is rare in *D. subviscosa*) on most parts; both species usually have papillae on the sepals, but those of *D. sely* are reddish. The ovary of *D. subviscosa* is rarely papillate at anthesis, then apparently becoming stellate as the flower matures. Since only one collection of *D. sely* exists, the possibility that it is a hybrid involving *D. digyna* or *D. subviscosa* should be considered.

28. Dombeya subviscosa Hochr., Candollea 3: 36–37. 1926. TYPE: Madagascar. Mahajanga: moyen [haut] bassin de Bemarivo (Boïna), Feb. 1907 (fl.), *H. Perrier de la Bâthie 5511* (lectotype, designated by Arènes [1958: 370], P!; isolectotypes, G not seen, G image!, K [4] not seen, K [4] images!, TAN not seen, TAN image!).

Tree to 25 m, with DBH to 20–30(–51) cm, or large shrub; bark gray or sometimes brown; twigs grayish to brown or dark brown, the youngest papillate, small-stellate or scaly, or rarely glabrate; stipules caducous, almost never present, deltoid to lanceolate, 1–3 mm, papillate; stipule scars on young twigs narrow, often slightly prominent but small and not conspicuous. Leaves lanceolate to ovate, elliptical, narrowly

lanceolate, oblong, or oblong-oblanceolate, aberrantly obovate, (3.3–)5–11.5(–13) × 1.3–4.5(–5) cm; petiole 4–13(–16) mm, papillate, stellate, or rarely glabrate; base rounded to somewhat oblique, shallowly cordate, or rounded-truncate, sometimes attenuate at extreme base; apex acuminate to cuspidate with an often rounded tip, rarely acute or rounded; margins irregularly crenate to crenulate, occasionally tending to dentate, serrate, or sinuate-crenulate, or subentire in smaller leaves, with glands variably located, sometimes protruding; both surfaces papillate with tiny flat papillae, sometimes sparsely stellate and occasionally also bearing long unbranched trichomes mostly around midrib beneath, or rarely glabrous; basal veins 5(to 7), the outer weak; main secondary veins above base (3)4 to 6(to 8) per side, visible on adaxial surface, sometimes prominent on adaxial surface; domatia present or absent, located at base of larger leaves or rarely in axils of lower secondary veins. Inflorescences often 2(3) per node, (1)2- to 15(to 22)-flowered, the largest within each subspecies umbelliform cymes with branched peduncles; peduncle 1–13(–22) mm, the longest in cymose inflorescences; pedicels (7.5–)11–24(–28) mm; peduncle and pedicels papillate or rarely stellate with small trichomes or glabrate; bracteoles rapidly caducous, rarely present; position of bracteole scars at anthesis ranges from immediately below flower to moderately lowered (or nearly to midpoint of pedicel). Sepals (2.5–)3–5 mm, mostly to entirely reflexed by late in flower, papillate (glabrous, glaucous); petals white to cream, (4.3–)5.5–9.4 × (2–)2.4–4.3(–5) mm, obovate to elliptical, mostly concave, symmetrical or nearly so; corona 0.5–1.1(–1.8) mm; stamens 15; filaments (1.5–)2–4.5(–6) mm; anthers 0.7–1.3(–1.7) mm; staminodes linear to narrowly spatulate, 1.4–3(–3.5) mm, shorter than longest fertile filaments; style 1.5–2.5(–3.6) mm, glabrous or short-pubescent over lower portion or most of length, sometimes with stellate trichomes only at base; style branches 2(rarely 3), 0.8–2(–2.4) mm; ovary stellate at least post-anthesis, in one subspecies often partly stellate to glabrate at anthesis, very rarely papillate with few apical trichomes. Fruit subglobose, 3.3–4.5 mm diam., stellate; seeds (1)2 per fruit, dark brown, with at least 1 flattened somewhat concave side, 2–2.5 mm, surface ridged and pebbled or striated.

Discussion. As herein defined, *Dombeya subviscosa* is a highly variable species complex that encompasses five species as circumscribed by Arènes (1958, 1959). The vast majority of the morphological variation is placed within one subspecies, *D. subviscosa* subsp. *subviscosa*, which is a common and widespread taxon native to northwestern Madagascar. Synonymized species names include *D. ambongensis* Arènes, within which Arènes (1958, 1959) recognized *D. ambongensis* subsp. *sakarahae* Arènes and *D. ambongensis* var. *ihosyensis* Arènes, from southwestern and central southern Madagascar, respectively. Those two taxa are currently recognized at the subspecies level within *D. subviscosa*. Though distinctive in vegetative morphology, their floral morphology is for the most part consistent with that of *D. subviscosa* subsp. *subviscosa*.

As for some other species described by Hochreutiner (cf. *Dombeya aquifoliopsis* and *D. digyna*), the two syntypes cited in the original publication appear to have been located at G. The first of these was *Perrier de la Bâthie 5511* (for which the G duplicate is the only one seen whose label says "haut bassin du Bemarivo," as quoted by Hochreutiner [1926: 36], whereas other duplicates seen say "moyen bassin"). The second cited syntype, "Hb. Perrier, n. 31 de Jumelle," has "Boïna, Marovato, bois" given as the locality. Arènes (1958: 370) designated the P duplicate of "*Jumelle 31 (Perrier 5511)*" as the lectotype. While Perrier and Jumelle sometimes gave separate collection numbers to the same gathering while working together, in this case there is no evidence that these two collections are of a single gathering. Further, none of the known Perrier duplicates, whose images are available on JSTOR (<www.jstor.org>), are marked with a Jumelle number. Thus, Arènes not only selected an isosyntype in preference to a syntype (possibly, though not explicitly, in conflict with Art. 9.12 of the ICN [McNeill et al., 2012]) but also mistakenly conflated the two syntype collections so that it was not clear which one was meant to supply the lectotype. Since no duplicate marked *Jumelle 31* was observed during study of material at P and the locality quoted by Arènes corresponded to that from *Perrier de la Bâthie 5511* (P), the latter specimen must have been the intended lectotype and is herein treated as such.

Leaves of *Dombeya subviscosa* have been variably reported to be caducous (*Perrier de la Bâthie 5511*, *Service Forestier 19074*, *19139*, *19159*) or persistent (*Service Forestier 16938*, *19904*); field observations indicate that leaves may be deciduous but do normally persist to fruiting. The bark fiber is used to make cords (*Reserves Naturelles 1867*); the wood is used for furniture, construction, and fencing (*Service Forestier 19102*, *19139*, *19159*, *19904*) and may be considered of superior quality, as the plant has been described as "espèce de Sely mais très fort" (*Service Forestier 19102*). Flowers are reported to be eaten by the golden-crowned sifaka, *Propithecus tattersalli* (*Meyers & Boltz 126*).

Birkinshaw 1535 is likely to be a hybrid involving *Dombeya subviscosa* and resembles that species except in having densely stellate indument on all parts including the sepals, very short peduncles, and petals to 9 mm long that are nearly symmetrical but often not convex; some inflorescences are partly cymose with short branches. Among the species of *Dombeya* sect. *Decastemon*, the most plausible second parent on morphological grounds would be *D. tavia* Arènes, native to the same region, which could contribute all of the aberrant characters except inflorescence branching; however, that poorly known taxon is itself very rare and conceivably of hybrid origin. It is also possible that a species of *Dombeya* sect. *Xeropetalum* could be the second parent.

Hybrid specimen. MADAGASCAR. **Mahajanga:** Bemanevika, 6 km E Marotaolana, *Birkinshaw et al. 1535* (MO, P).

KEY TO THE SUBSPECIES OF *DOMBEYA SUBVISCOSA*

1a. Usually a tree, to 25 m; leaf marginal glands variably located, usually not at tooth apices; inflorescences (1- to)3- to 15(to 22)-flowered; bracteole scars usually not more than moderately below flower on pedicel; northwestern Madagascar ..... 28a. subsp. *subviscosa*

1b. Shrub or small tree; leaf marginal glands at tooth apices or in apical margins; inflorescences (1)2- to 5(to 10)-flowered; bracteole scars always well below flower on pedicel; southwestern to southern central Madagascar.

2a. Leaves with basal domatia usually present; blades lanceolate, occasionally to oblong, elliptical, or rarely narrowly lanceolate or ovate when young, (1.4–)2–4.5 cm broad; petals (6–)7.8–9.4 mm, probably ascending in flower..... ..... 28b. subsp. *ihosyensis* (Arènes) Appleq.

2b. Leaves with basal domatia usually absent; blades narrowly lanceolate to lanceolate or rarely ovate when young, 1.3–2.5(–3) cm broad; petals 5.5–7 mm, not conspicuously ascending ..... 28c. subsp. *sakarahae*

28a. Dombeya subviscosa Hochr. subsp. **subviscosa.**

Dombeya ambongensis Arènes [subsp. *ambongensis*] var. *ambongensis*, Candollea 16: 365–366. 1958, syn. nov. TYPE: Madagascar. Mahajanga: RN 8 [Namoroka], canton Andranomavo, distr. Soalala, terrain argileux, 30 Mar. 1953 (fl.), *Reserves Naturelles 5125* (holotype, P!; isotypes, MO!, P!, TAN not seen, TAN image!, TEF not seen, TEF image!).

Dombeya ambongensis Arènes [subsp. *ambongensis* var. *ambongensis*] f. *bevazahensis* Arènes, Candollea 16: 366. 1958, syn. nov. TYPE: Madagascar. Mahajanga: Bevazaha, canton Tsaramandroso, distr. Ambato–Boeni, forêt sablonneux, 12 Feb. 1949 (fl.), *Reserves Naturelles 1867* [as "*1807*"] (holotype, P!).

Dombeya ankarafantsikae Arènes, Candollea 16: 370–371. 1958, syn. nov. TYPE: Madagascar. Mahajanga: Ankarafantsika (7e Réserve), s.d. (fr.), *Service Forestier No. 11* (holotype, P!; isotype, P!).

Dombeya boeniensis Arènes, Candollea 16: 363–364. 1958, syn. nov. TYPE: Madagascar. Mahajanga: RN 7 [Ankarafantsika], canton Tsaramandroso, distr. Ambato–Boeni, forêt sablonneux, 5 Apr. 1951 (fl.), *Reserves Naturelles 2816* (holotype, P!; isotypes, P!, TAN not seen, TAN image!, TEF not seen, TEF image!).

Dombeya mafimafy Arènes, Candollea 16: 384. 1958, syn. nov. TYPE: Madagascar. Mahajanga: Andapinarosy, Befandriana–Nord, 2 Mar. 1957 (fl.), *Service Forestier 3342* (holotype, P!; isotypes, P [2]!).

Dombeya subviscosa var. *brevistaminodia* Arènes, Candollea 16: 370. 1958, syn. nov. TYPE: Madagascar. Mahajanga: RN 7 [Ankarafantsika], canton Tsaramandroso, distr. Ambato–Boeni, 5 Apr. 1951 (fr.), *Reserves Naturelles 2828* (holotype, P!; isotypes, P!, TAN [2] not seen, TAN [2] images!).

Tree to 25 m, with DBH to 20–30(–51) cm, rarely a shrub; bark mottled gray, sometimes becoming brown and strongly furrowed on all or part of trunk; twigs grayish to brown or dark brown, the youngest papillate, stellate with small, sometimes scaly trichomes, or rarely glabrate. Leaves lanceolate to ovate or elliptical, occasionally somewhat oblong, seldom to oblong-oblanceolate or aberrantly obovate, 5–10.6(–13) × 1.6–4.3(–5) cm; petiole 4–12(–16) mm, papillate or stellate; base usually rounded, occasionally oblique, shallowly cordate, or rounded-truncate, rarely attenuate at extreme base and then domatia never present; apex acuminate to cuspidate with an often rounded tip, very rarely rounded or acute; margins irregularly crenate to crenulate, subentire in smaller leaves, or rarely crenate-dentate, with glands variably located between teeth or in apical margins of teeth, seldom in tooth apices; both surfaces papillate, sometimes sparsely stellate and occasionally also bearing long unbranched trichomes mostly around midrib beneath, or glabrous; basal veins 5(to 7); main secondary veins above base (4)5 or 6(to 8) per side, in small/young leaves not prominent on abaxial surface, in larger leaves somewhat prominent; domatia often present at base of larger leaves, occasionally in axils of lower secondary veins, small but often well developed, surrounded by unbranched trichomes. Inflorescences (1- to)3- to 15(to 22)-flowered; peduncle (1.5–)4–13(–22) mm; pedicels (7.5–)11–23(–28) mm; peduncle and pedicels papillate or rarely stellate with small trichomes, sometimes papillate on otherwise stellate individuals; bracteoles 0.7–1.1 mm, broadly deltoid, papillate; position of bracteole scars at anthesis ranges from immediately below flower to moderately lowered, very rarely nearly to midpoint of pedicel. Sepals (2.5–)3–4.2(–4.6) mm, papillate or less often glabrous or glaucous; petals (4.3–)5.5–8(–8.3) × (2–)2.4–

4(–4.6) mm; filaments (1.5–)2–4.5 mm; staminodes 1.4–2.4(–3.5) mm; style glabrous or bearing short straight trichomes over lower portion or most of length, sometimes with stellate trichomes only at base; style branches 2(rarely 3), 0.8–1.5(–2.4) mm; ovary stellate post-anthesis, in early flower ranging from glabrate except for a few trichomes at base of style to stellate only apically or stellate throughout, or very rarely papillate with trichomes at apex and style base. Fruit subglobose, somewhat vertically compressed or broadest at base; seeds (1)2 per fruit, irregularly shaped, ranging from roughly ovate-elliptical to elliptical, broadly oblong or suborbicular, surface ridged and striated.

Distribution, habitat, and phenology. *Dombeya subviscosa* subsp. *subviscosa* occurs in dry forests of northwestern Madagascar at elevations from 2 to at least 293 m. Reported substrates include black, red, and yellow sand, gneiss, and less frequently limestone. It flowers from February to May and fruits from April to June (seldom in March).

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya subviscosa* subsp. *subviscosa* is noted as Least Concern or LC.

Vernacular names. Mafimafy (*Service Forestier 3342*, *5876*, *15081*, *16938* [Tsimihety dialect], *18536*, *19074* [Tsimihety dialect], *19102* [Tsimihety dialect]), mananjara (*Reserves Naturelles 5408*), seliala (*Reserves Naturelles 10305*), selibe (*Reserves Naturelles 10289*), selimalitalita (*Reserves Naturelles 1867*, *Service Forestier* [?] *No. 17*), selivato (*Applequist et al. 275*, *Service Forestier 3556*, *5357*, *19139* [Marofotsy dialect], *19159* [Marofotsy dialect]), sely (*Resereves Naturelles 10070*, *Service Forestier 10392*, *19904*), sely ara (*Service Forestier 3489*), sely malalihy (*Meyers & Boltz 126*), voambarihy (*Reserves Naturelles 5125*).

Discussion. *Dombeya subviscosa* is probably closely related to *D. ambohitrensis* and *D. vohemarensis*, both native to extreme northern Madagascar and similar enough to be confused with *D. subviscosa* subsp. *subviscosa*. *Dombeya ambohitrensis* has pedicels to 12(–16) mm, narrower petals (not exceeding 2.5 mm broad), a glabrous style, and an ovary that is papillate throughout fruit development. *Dombeya vohemarensis* is distinguished by its shrubby habit, sinuate leaf margins, very low bracteole scars, longer and usually not reflexed sepals, and staminodes about equal to the longest filaments.

The *Dombeya subviscosa* subsp. *subviscosa* complex was treated as five distinct species by Arènes (1958, 1959) and is wide ranging and extremely diverse in morphology. Variable characters include leaf shape, width of the leaf base and conformation of the apex, indument of vegetative parts, number of flowers per inflorescence, pedicel length, position of bracteole scars, and corona length. Within the presently available material, there do not seem to be identifiable suites of characters. A broad range of combinations of character states can be seen, which implies that any subgroups involved are not reproductively separated. Morphological change over the growing season may exacerbate taxonomic confusion. Young leaves are fairly consistent in appearance, being lanceolate to narrowly ovate, sometimes tending to oblong, with an acuminate apex, subentire margins, and weak venation. Mature leaves, which have much stronger venation and marginal crenation, vary from ovate and acuminate to broadly ovate or elliptical with a broad base and short-acuminate or cuspidate apex or narrower and more oblong with a very long narrow acuminate apex. On specimens representing all of these mature forms, similar-looking young leaves can be seen, and the form of mature leaves also varies within individuals as well as regions. At flowering, all leaves are often young, whereas fruiting specimens often have largely mature leaves and, therefore, may appear quite different. Another confusing factor is that while the fruit is almost always stellate, the ovary of most specimens in early flower initially bears stellate trichomes only apically, the basal portion apparently becoming stellate only after anthesis. In all other taxa of *Dombeya* sect. *Decastemon* with stellate ovaries, the indument is well developed by the time of anthesis.

Dombeya subviscosa subsp. *subviscosa* as herein circumscribed includes both *D. boeniensis* and *D. ambongensis* var. *ambongensis* as synonyms. Arènes (1958, 1959) placed the latter two in a different subseries based on the fact that the petioles were glabrous rather than being stellate when young (specimens with mature leaves are less likely to display stellate pubescence). However, this character can vary even within a single plant. *Dombeya boeniensis* and *D. ambongensis* were distinguished by differences in their leaf shape; the material now available suggests that variation in leaf shape between those two forms (which do not represent the extremes of the range) is essentially continuous. Most collections fall into this group, which would appear quite variable even if specimens with exceptionally broad leaves or basally positioned bracteoles (see below) were excluded due to variation in pubescence, number of flowers, length of pedicels, etc. *Dombeya ambongensis* f. *bevazahensis*, defined by

the supposed absence of staminodes, falls into this group; it was described from two specimens that are in rather poor condition, but at least some flowers on each do have staminodes.

Dombeya subviscosa var. *brevistaminodia* was supposedly distinguished by its unusually short staminodes, but the mounted material has only maturing fruit without intact androecia, leading to the suspicion that damaged flowers have been misinterpreted or that the fragments of a flower barely post-anthesis in the fragment packet of the type specimen may have been mixed up. However, the type is one of the few specimens with mature leaves that are broadly elliptical with cuspidate apices. Segregation of those specimens at some level may be appealing, but is so far unsupported by other characters; therefore, this variety is synonymized under the autonymic subspecies of *D. subviscosa*.

The approximate position of bracteole scars on the pedicel at and after anthesis is usually consistent among specimens included within the *Dombeya subviscosa* subsp. *subviscosa* group. However, three collections (*Service Forestier No. 142*, *10392*, and *19904*) have bracteole scars borne very low on the pedicel as is seen in *D. subviscosa* subsp. *sakarahae* or *D. subviscosa* subsp. *ihosyensis*, or perhaps the related species *D. ambohitrensis* and *D. vohemarensis*. These collections all have immature leaves and rather few and small flowers (petals not over 6.5 mm). One is from the Ankarafantsika region, where other more typical specimens have also been collected; the other two represent the only known collections from Maintirano. No other characters have yet been found to distinguish these specimens from existing material of the *subviscosa* group.

Dombeya mafimafy, described from a single specimen, was distinguished by its papillate ovary. The holotype *Service Forestier 3342*, in early flower, also frequently has a few trichomes at the juncture of ovary and style, as is seen in the young flowers of *D. subviscosa* subsp. *subviscosa* collections with late-developing indument. The ovary ranges from glabrate to scaly (with most flowers barely at anthesis), and the corona is unusually long. *Dombeya mafimafy* otherwise appears consistent with *D. subviscosa* subsp. *subviscosa* and is probably interpretable as an aberrant individual of that subspecies, or at most a local variant; the name is, therefore, synonymized.

Dombeya ankarafantsikae, also described from a single specimen (*Service Forestier No. 11*), was distinguished by its narrow petals and by stamens putatively occurring in groups of two or three, therefore, sometimes fewer than 15. The type specimen is fruiting, and material is not adequate to confirm this variation in stamen number. The specimen is much more remarkable because its sepals are mostly not reflexed, and its leaf morphology is rather unusual. However, as noted, more typical populations of *D. subviscosa* also occur in and around Ankarafantsika, and recent collections by the author in several forests in that area did not relocate any populations with comparable morphology. The best placement of *D. ankarafantsikae* lies within the synonymy of *D. subviscosa* subsp. *subviscosa*.

Additional specimens examined. MADAGASCAR. **Antsiranana:** Antsahalalina, 12 km E of Daraina, *Meyers & Boltz 126* (MO, P). **Mahajanga:** Ankarafantsika Natl. Park, *Applequist et al. 269*, *270*, *271*, *272*, *273*, *274*, *276* (G, MO, P, TAN, US); SE of Ankarafantsika Natl. Park, *Applequist et al. 275* (MO, P, TAN); Mariarano, N of Mahajanga, *Applequist et al. 277* (G, MO, P, TAN, US); Maevatanana–Berivotra, *Descoings 3482* (MO [2]); Tsaratanana RN 4 between Ampijoroa and Andranofasika, *Dorr & Koenders 3057* (MO, P); Ankarafantsika, *Gentry & Schatz 62096* (MO); H[aut] Bemarivo (Boïna), *Perrier de la Bâthie 2282* (P [2]); Marovato (Boina), *Perrier de la Bâthie 12166* (P); Ankarafantsika RN, Tsaramandroso, *Reserves Naturelles 2921* (P [2]); Namoroka RN, Andranomavo, Soalala, *Reserves Naturelles 5408* (MO, P [3]); Andranomavo, Soalala, *Reserves Naturelles 7351* (MO, P [2]); Antsalova, *Reserves Naturelles 10070* (P [3]); W of Antsalova, *Reserves Naturelles 10289* (MO, P [4]); Antsalova, *Reserves Naturelles 10305* (P [5]); Bevazaha, *Service Forestier* [?] *No. 17* (P [3]); Namoroka, *Service Forestier No. 28* (MO, P); Bevasaha, Ankarafantsika, *Service Forestier No. 142* (P); Ambaindahy, Ambolomoty, *Service Forestier 3489* (P); Ampijoroa, Ankarafantsika, *Service Forestier 3556* (P); Besalampy, *Service Forestier 5357* (MO, P); Mitsinjo, *Service Forestier 5744* (MO [2], P); Ampandrana, Port Bergé, *Service Forestier 5876* (P); Antanandava, near Maintirano, *Service Forestier 10392* (MO [4], P [3]); Analahefina, Antonibe, Analalava, *Service Forestier 15081* (MO, P [4]); Bora, Ampombilava, Antsohihy, *Service Forestier 16938* (MO, P); Androhimenabe, NE of Amparihimikimbo (E of the Baie de Narinda), *Service Forestier 18536* (MO, P [2]); Antsahamangitrika, Mahalina, Tsarahonenana, *Service Forestier 19074* (P); Tsimaimborano, Marovato, Antonibé, *Service Forestier 19102* (MO, P [2]); Ampasindava, Tsaratanana, *Service Forestier 19139* (MO, P), *19159* (P [2]); rte. Marofandroboaka–Mitsinjo, *Service Forestier 19486* (MO, P); Beabata, Ambiky, Maintirano, *Service Forestier 19904* (P).

28b. Dombeya subviscosa Hochr. subsp. **ihosyensis** (Arènes) Appleq., comb. et stat. nov. Basionym: *Dombeya ambongensis* Arènes [subsp. *ambongensis*] var. *ihosyensis* Arènes, Candollea 16: 366. 1958. TYPE: Madagascar. Fianarantsoa: vestiges de forêts tropophylles, dans la vallée de la Menarahaka, à l'E d'Ihosy, Feb. 1955 (fl.), *Service Forestier 11638* (holotype, P!; isotypes, MO [2]!, P [2]!, TEF not seen, TEF image!).

Large shrub; twigs grayish brown, the youngest minutely papillate. Leaves lanceolate, occasionally tending to oblong or elliptical, very rarely to ovate

especially in young leaves, 6–11.5 × (1.4–)2.3–4.5 cm; petiole 6–13 mm, papillate, occasionally with a few flat-stellate trichomes, or rarely stellate when young; base somewhat oblique, rarely somewhat rounded-truncate to rounded; apex acuminate or rarely acute with a rounded tip; margins irregularly crenate to crenulate or crenate-serrulate (to sinuate), with glands located in apices or apical margins of teeth; both surfaces papillate, rarely sparsely stellate especially when young; basal veins 5(6 or very rarely 7); main secondary veins above base 4 or 5(to 7) per side, prominent on abaxial surface; domatia usually present at base, well developed with a "roof" and sparse unbranched trichomes. Inflorescences 2- to 5(to 8)-flowered; peduncle 1.5–6 mm, papillate; pedicels (15–)18–24 mm, papillate with whitish or occasionally reddish papillae; bracteoles not seen, bracteole scars at anthesis well below flower on pedicel. Sepals 4.3–5 mm, papillate; petals (6–)7.8–9.4 × 3.6–4.3(–5) mm, probably ascending in flower; filaments 3.5–6 mm; staminodes 2–3 mm; style glabrous or with few small trichomes at base; style branches two, 1.5–2 mm; ovary stellate. Fruit possibly subglobose, slightly compressed, 4–5 mm; mature seeds unknown.

Distribution, habitat, and phenology. *Dombeya subviscosa* subsp. *ihosyensis* is native to dry forests in southern Madagascar; the only reported altitude is 700–800 m. Its usual substrate is sand, though the aberrant *Service Forestier 26046* (discussed below) was collected on red lateritic soil. It flowers in January and February and fruits in March; *Service Forestier 26046* flowered in early March.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya subviscosa* subsp. *ihosyensis* is noted as Endangered or EN B1ab(iii)+2ab(iii). Only two localities are known; one atypical specimen is from a protected area, but the other existing collections (all made in 1955) were from a previously existing forest near Ihosy that has suffered serious degradation and is now essentially gone. No recent collections have been made.

Discussion. *Dombeya subviscosa* subsp. *ihosyensis* is distinguished from the autonymic *D. subviscosa* subsp. *subviscosa* by its more conspicuous domatia, smaller inflorescences, lowered bracteole scars, and usually larger, strongly ascending petals. Although this subspecies is very rare, morphological variation is problematically great. The only specimen not from Menarahaka, *Keraudren 462*, bears significant stellate indument on the leaves; its leaves have often symmetrical bases and few, small domatia. The specimen is only in bud, so its identity might be questionable; however, it cannot be identified as *D. subviscosa* subsp. *sakarahae* or any other species in the section. The leaves appear immature, and immature leaves may have stellate trichomes that are later lost. This specimen is only tentatively identified as *D. subviscosa* subsp. *ihosyensis*. *Service Forestier 13789* from Menarahaka, the only fruiting specimen seen, has small and narrow leaves with sometimes sinuate margins, a heavily papillate indument, and shorter petals (6 × 3.5–4 mm vs. 7.8–9.4 mm in other specimens from the area). This specimen is herein interpreted as an unusual individual, or potentially a hybrid.

Service Forestier 26046, a specimen in early anthesis with few flowers in poor condition, strongly resembles *Keraudren 462* but with a more strongly stellate indument, as well as short unbranched trichomes on the lower leaf surface and sometimes reddish papillae on most parts; it has no domatia. Though the vegetative appearance is more similar to *Dombeya subviscosa* subsp. *ihosyensis* than to any other known taxon from the region, the petals are short and broad (6.5 × 4.1 mm), the style branches and filaments are short, and the bracteoles are borne immediately below the flower. This specimen may represent a hybrid between *D. subviscosa* subsp. *ihosyensis* and another species from the region, most likely *D. ambalabeensis*.

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** high valley of the Menarahaka E of Ihosy, 28 Jan. & 10 Apr. 1955, *Humbert 28596* (P); Menarahaka, Ihosy, 28 Jan. 1955, *Service Forestier 13736* (P); Menarahaka, Ihosy, 20 Mar. 1955, *Service Forestier 13789* (P). **Toliara:** Zombitsy, near Sakarafaka, Mar. 1960, *Keraudren 462* (P).

Hybrid specimen. MADAGASCAR. **Toliara:** Analamaribe, near Analamary, Ianakafy, *Service Forestier 26046* (P).

28c. Dombeya subviscosa Hochr. subsp. **sakarahae** (Arènes) Appleq., comb. nov. *Dombeya ambongensis* Arènes subsp. *sakarahae* Arènes, Candollea 16: 366. 1958. TYPE: Madagascar. Toliara: Analamary, Sakaraha, 22 Jan. 1951 (fl.), *Service Forestier 2810* (holotype, P!; isotypes, TAN not seen, TAN image!, TEF not seen, TEF image!).

Dombeya ambongensis [subsp. *sakarahae*] var. *fandrareensis* Arènes, Candollea 16: 367. 1958, syn. nov. TYPE: Madagascar. Toliara: plateau calcaire au N du Fiherenana, forêt sèche de Fandrare a 40 km NE de Tulear, vers 400 m, Mar. 1934 (fl.), *H. Humbert 14333* (holotype, P!; isotype, P!).

Small tree, or much-branched shrub to 5 m with DBH to 5 cm; bark grayish; twigs grayish brown, the

youngest minutely scaly to sparsely papillate or glabrate. Leaves narrowly lanceolate to lanceolate, very rarely to ovate especially in young leaves, 3.3–8.5 × 1.3–2.5(–3) cm; petiole 3–10(–12) mm, flat-papillate to glabrate, occasionally with a few flat-stellate trichomes; base rounded to shallowly cordate or oblique; apex acuminate or rarely acute; margins irregularly sinuate-crenulate to crenate, crenate-dentate, or serrate with usually rounded teeth, with glands located in apices or apical margins of teeth; both surfaces papillate to glabrate, sometimes with rare stellate trichomes; basal veins 5; main secondary veins above base (3)4 or 5(6)per side, not prominent on abaxial surface; domatia usually absent, rarely present at base. Inflorescences (1)2- to 4(to 10)-flowered, sometimes numerous and forming relatively large clusters; peduncle 1–6.5(–10) mm, papillate to glabrate; pedicels (12–)16–20 mm, papillate or rarely glabrate; bracteoles broadly ovate, ca. 0.5 mm, bracteole scars at anthesis well below flower on pedicel. Sepals 3.6–4.5(–5) mm, papillate; petals 5.5–7 × 2.5–3.5(–4.1) mm; filaments (2–)3–4.5 mm; anthers 1–1.3(–1.5) mm; staminodes 1.5–2.8 mm; style basally stellate or glabrous; style branches two, 1–2 mm; ovary stellate. Fruit subglobose, stellate; seeds 2 per fruit, roughly hemispherical, surface slightly pebbled and minutely ridged.

Distribution, habitat, and phenology. *Dombeya subviscosa* subsp. *sakarahae* is native to dry forests in southwestern Madagascar, on both white sand and limestone at altitudes of 35–850 m. It flowers from January to March and fruits from March to June.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya subviscosa* subsp. *sakarahae* is noted as Vulnerable or VU B1ab(iii)+2ab(iii). Fewer than 10 localities are recorded, only one in a protected area, and severe habitat degradation has occurred in its native range.

Vernacular names. Faikafotse (*Service Forestier 2810*), sarivala (*Service Forestier 11921*).

Discussion. *Dombeya subviscosa* subsp. *sakarahae* is distinguished, though not altogether reliably, from the other two subspecies by its usually narrower leaves that seldom have domatia. It is further distinguished from *D. subviscosa* subsp. *subviscosa* by its fewer-flowered inflorescences and lowered bracteole scars, and from *D. subviscosa* subsp. *ihosyensis* by its smaller flowers (petals 5.5–7 mm vs. [6–]7.8–9.4 mm), with petals not ascending. *Dombeya anakaensis* also has often narrowly lanceolate leaves and occurs in southwestern Madagascar; it lacks papillae on the inflorescences and has bracteole scars immediately below the flower, staminodes usually longer than the filaments, and a papillate ovary, as well as the distinctive calyx morphology in fruit that it shares with *D. ambalabeensis*.

Arènes (1958, 1959) recognized *Dombeya ambongensis* var. *fandrareensis* based primarily upon the presence of small caducous stellate trichomes on the leaves of the type. The name is synonymized because this and other characters are in fact variable within this taxon's relatively continuous range (e.g., one leaf on the type of *D. ambongensis* subsp. *sakarahae* bears stellate trichomes).

Service Forestier 11921, a specimen in early flower, is suggested to be a hybrid of *Dombeya subviscosa* subsp. *sakarahae* × *D. anakaensis*. The specimen resembles the former taxon except in having inflorescences with up to seven or eight flowers on thickened peduncles, bracteoles borne close to the receptacle, shorter pedicels (as little as 7.5 mm in full flower), smaller flowers (petals 4–5.5 × 1.5–2.1 mm), and shorter filaments (1–1.8 mm vs. staminodes 1.5 mm). These characters are generally consistent with *D. anakaensis* parentage.

Additional specimens examined. MADAGASCAR. **Toliara:** Zombitsy, 10.1 km NE of Sakaraha, *Barnett 509* (MO); 45–55 km E of Tulear on rd. to Andranovory, *Croat 31072* (MO, P); "S de la forêt d'Analafanja au N du Fiherenana, plateau au S de Mitsinjy," *Humbert 14316* (P [2]); Beandro, 55–60 km NE of Tulear, *Humbert 29552* (P); Zombitsy (Sakaraha), *Humbert et al. 29562* (MO, P); 55 km NE of Morondava via Rte. 8, Kirindy Forest, *Noyes et al. 1018* (P); Morondava, *Rahantamalala 188* (P); Zombitsy, *Service Forestier 18598* (P [3]).

Hybrid specimen. MADAGASCAR. **Toliara:** Zombitsy, *Service Forestier 11921* (MO, P [2]).

29. Dombeya tulearensis Arènes, Candollea 16: 380–381. 1958. TYPE: Madagascar. Toliara: RN X [Tsimanampetsotsy], distr. Tulear, 28 Feb. 1950 (fl.), *Reserves Naturelles 2509* (holotype, P!; isotypes, MO!, P!).

Dombeya meneriky Arènes, Candollea 16: 381. 1958, syn. nov. TYPE: Madagascar. Toliara: massif de Vohitsiandriana, au N du Cap Andrahomana, vers 350 m, Mar. 1955 (fl.), *Service Forestier 11836* (holotype, P!; isotype, P!).

Tree to 9 m, DBH to 20 cm, much branched, or a shrub to 5 m, with smooth gray bark; twigs grayish to dark brown, the youngest stellate with small reddish (very rarely mostly white) trichomes; stipules caducous, deltoid-acuminate to lanceolate-acuminate or ovate, 2–3 mm, stellate; stipule scars on young twigs narrow, sometimes moderately prominent, inconspic-

uous or dark. Leaves quite variable in shape, very often somewhat oblong, ranging from oblong-elliptical to narrowly ovate or lanceolate, elliptical, oblong-oblanceolate, or rarely narrowly elliptical, 3.5–7.2 × (1–)1.5–2.6(–3.2) cm; petiole (4–)6–12(–16) mm, reddish or rarely pale stellate; base oblique or rounded and sometimes tapering at the extreme base; apex acute to short-acuminate, rounded, or rarely emarginate; margins variably small-toothed or shallowly wavy, often subentire, with brownish glands usually located at apices of teeth; both surfaces sparsely reddish to pale stellate; basal veins (4)5(to 7), all but the innermost pair weak, the innermost pair often decurrent from midvein; secondary veins above base 3 to 5 per side, visible on abaxial surface, very prominent on adaxial surface; domatia usually inconspicuous but present on most large leaves in one or more pairs of secondary vein axils and often at base, those at base usually simple small hollows in vein axils, more likely to be present when leaf base is relatively symmetrical, those borne in secondary vein axils also small but frequently covered. Inflorescences 2- to 7(to 9)-flowered, sometimes an umbelliform cyme with divided peduncle or rarely a few-flowered condensed cyme, sometimes numerous and forming relatively large clusters; peduncle 1.5–7.5 mm; pedicels (5.5–)7–15 mm; peduncle and pedicels stellate, the trichomes pale red to nearly white; bracteoles caducous, rarely persisting to anthesis, ovate to broadly elliptical or deltoid, often cuspidate or short-acuminate, 1–1.6(–2.5) mm, stellate, borne immediately beneath flower. Sepals (3.7–)4.2–5.2(–7) mm, usually reflexed in flower, reflexed and then dehiscent in fruit, papillate to glabrous or rarely with some stellate trichomes; petals white to cream, (5.6–)6–8(–9) × (3–)3.5–5(–5.8) mm, elliptical to obovate, moderately asymmetrical to nearly symmetrical, mostly concave in fruit, at anthesis no more than slightly concave around apical margin; corona 1.4–2(–2.4) mm, often narrowed above ovary; stamens 15; filaments (0.7–)2–4.8 mm, sometimes irregularly fused above corona; anthers 0.9–1.3 mm; staminodes narrowly spatulate or rarely linear, 2.5–4(–5.5) mm, almost always shorter than the longest fertile stamens; style 2.8–4(–5.2) mm; style branches two, 0.8–1.5 mm; ovary dark, papillate. Fruit broadly ellipsoid to subglobose with a narrowed apex at least during development, at least sometimes globose at maturity, (4–)5–6 mm diam., blackish at maturity when dried but reportedly green when fresh, papillate; seeds 1 per fruit, dark brown, 3.5 mm, irregularly shaped, broadly ellipsoid, with 3 sides deeply sunken or possibly laterally compressed, surface minutely ridged and sometimes appearing papillate.

Distribution, habitat, and phenology. *Dombeya tulearensis* is native to dry (or seldom subhumid) forest and brush in southern Madagascar, on sand or rock, including granite, sometimes along waterways, at altitudes of 100–1000 m. It flowers from December to March (rarely to May) and fruits from February to May (rarely in January).

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya tulearensis* is noted as Least Concern or LC.

Vernacular names. Hazofotsy (*Reserves Naturelles 6207*), kambahy (*Reserves Naturelles 2505bis*), mandoavato (*Reserves Naturelles 2509*), mandohavato (*Reserves Naturelles 2760*), meneriky (*Humbert 13047*; dialect Antandroy), valafotsy (*Service Forestier 5293*).

Discussion. *Dombeya tulearensis* was distinguished from *D. meneriky* by Arènes (1958) based on variation in stipule and bracteole morphology and the occurrence of rare trichomes on the sepals of *D. tulearensis*; the two are clearly conspecific. The two epithets have equal priority; *D. tulearensis* is preferred because it may have been slightly more often used and seems more informative (Tulear being a familiar locality in Madagascar).

Flowers of *Dombeya tulearensis* are reported to be sweet-scented (*Boiteau 2533*, *Du Puy & Du Puy MB560*) and frequented by bees (*Du Puy & Du Puy MB560*). The stem may also have a distinct scent (*Randriamampionona 117*).

Service Forestier 22625, which comes from an area where typical *Dombeya tulearensis* has been collected, has very large (to 9.4 cm) ovate to lanceolate leaves, with acuminate to cuspidate apices, crenate-serrate margins with conspicuous rounded teeth, and an unusual number of basal and secondary veins. The inflorescences are up to 10-flowered, and those with the most flowers tend to be cymose, though without elongated internal branches; the flowers are slightly larger than typical of *D. tulearensis*. This specimen is suggested to be a hybrid between *D. tulearensis* and another species of *Dombeya*, possibly belonging to *Dombeya* sect. *Xeropetalum* rather than *Dombeya* sect. *Decastemon*. Putative hybrids involving *D. tulearensis* and other species of *Dombeya* sect. *Decastemon* have been otherwise noted.

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** Ihosy, Bemanda, *Cours 5126* (MO, P); Ihosy, *Humbert 14453* (P); Horombe plateau, near inter-

section of routes from Ihosy to Fort Dauphin and Tuléar, *Service Forestier 22604* (P). **Toliara:** Bevilany, *Boiteau 2533* (MO, P); SE coast, *Descoings 628, 649* (MO); NE of Amboasary, N of Ankilitelo, 5 km N of RN 13, *Du Puy & Du Puy MB560* (MO, P [2]); Andohahela RNI, Ranopiso, *Eboroke 812* (MO, P); valley of the Manambolo, left bank, Isomono, monts Kotriha and Isomonobe, *Humbert 12807* (MO, P [2]); valley of the Manambolo, right bank, Isomono, *Humbert 13047* (MO, P [5]); mont Vohitrandriana S of Ranopiso, *Humbert & Capuron 29152* (MO, P); Zombitsy, *Humbert et al. 29659* (P); Andohahela, parcelle 3, *Phillipson & Milijaona 3532* (MO); "entre le rite de l'hombre et Fort Dauphin," *Rabevohitra 2231* (MO, P); Andohahela, parcelle 3, *Randriamampionona 117* (MO, P); Andohahela, parcelle 3, *Randriamampionona 288* (MO, P); Tsimelahy, near Andohahela parcelle 2, 9 km N of Karera, *Randrianaivo et al. 97* (MO, P); Anosy, Ankoba, 12 km NE of Ambatoabo, *Randrianaivo et al. 1549* (MO); Tsimanampetsotsy RN, *Reserves Naturelles 2505bis* (P [3]); Andohahela, *Reserves Naturelles 2760* (P [3]); RN XI, canton Behara, distr. Androy, *Reserves Naturelles 6207* (MO, P); Zombitsy Natl. Park, Ambakitany, N of Natl. Rte. 7, *Rogers et al. 850* (MO); Anjiozio, Vohimainty, Behara, *Service Forestier 5293* (P [2]); massif of Vohipary, NW of Andalatanosy (Antanimora), *Service Forestier 22497* (MO, P).

Hybrid specimen. MADAGASCAR. **Fianarantsoa:** basin of the Menarahaka, near intersection of routes from Ihosy to Ivohibe and Iakora, *Service Forestier 22625* (MO, P).

30. Dombeya vohemarensis Appleq., sp. nov. TYPE: Madagascar. Antsiranana: fivondronana Vohémar, firaisana Nosy Be, fokontany Anjiabe, forêt d'Analabe, 13°04′43″S, 049°54′04″E, 11 May 2004 (fr.), *D. Rabehevitra, R. Razakamalala & Mathieu 941* (holotype, MO!; isotypes, P!, TEF not seen). Figure 5.

Diagnosis. Differs from *Dombeya subviscosa* Hochr. subsp. *subviscosa* in having a shrubby habit, leaves with sinuate margins, bracteole scars on pedicel in fruit well below receptacle, sepals longer (5–6.5 mm) and mostly not reflexed, staminodes similar in length to filaments of fertile stamens.

Shrub to 5 m or tree to 12 m, with DBH to 10 cm; twigs grayish or dark brown, the youngest papillate with minute papillae or small flat scales; stipules caducous, lanceolate, 1–1.6 mm, papillate or scaly; stipule scars on young twigs usually small, inconspicuous, dark, but sometimes prominent with the extreme base of stipule appearing to persist (very broad pale scars at nodes are bud or peduncle scars). Leaves ovate to lanceolate or oblong-ovate, 5–8.5 × 1.8–4 cm; petiole 5–11 mm, minutely papillate; base rounded to shallowly cordate, in most large leaves shallowly cordate; apex acuminate or occasionally cuspidate with a rounded tip; margins irregularly sinuate to crenate-sinuate, with glands usually located on apical side of marginal convexities, often protruding especially near leaf apex; both surfaces papillate with tiny flat papillae to glabrous, rarely sparsely stellate; basal veins 5(to 7), all but the inner weak; main secondary veins above base 3 to 5(6) per side, visible on abaxial surface; domatia usually present at base of larger leaves, sometimes absent, if present often well developed with a distinct roof, but no or a few straight or few-branched trichomes in association. Inflorescences 1 or 2 per node, 1- to 3(to 5)-flowered, the larger with branched peduncles; peduncle 1–5.5 mm, papillate or flat-scaly; pedicels 14–22 mm, papillate; bracteoles immediately caducous, rarely present, ca. 0.5 mm, irregularly ovate to broadly oblong, papillate; at full elongation of pedicel position of bracteole scars ranges from below midpoint of pedicel to above midpoint but well beneath flower. Sepals 5–6.5 mm, mostly not reflexed, papillate; petals 8–9.8 × 3.6–5.3 mm, obovate to elliptical, often somewhat concave, symmetrical or nearly so; corona 0.7–1.1 mm (postanthesis); stamens 15; filaments (1.2–)2.4–3.8 mm; anthers (1–)1.3–1.7 mm; staminodes linear, (2.5–)3–4 mm, usually similar in length to filaments of fertile stamens; style 3.2–4 mm, glabrous or bearing minute trichomes or papillae; style branches two, 1.5–2 mm. Fruit subglobose, somewhat vertically compressed or broadest at base, 3–4.2 mm diam., densely stellate; mature seeds not seen, only 1 ovule per fruit or possibly 1 per locule developing.

Distribution, habitat, and phenology. *Dombeya vohemarensis* is native to humid forests of extreme northern Madagascar, on sand. One collection (*Ranirison 591*) noted an elevation of 415 m. Material in flower has been collected in April and immature fruits in April and May.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya vohemarensis* is noted as Endangered or EN B2ab(iii). Fewer than five localities are known, none in protected areas, and habitat degradation is ongoing in the area.

Discussion. *Dombeya vohemarensis* is distinguished from the messy *D. subviscosa* species complex (see previous discussion) by several features, including its generally sinuate leaf margins, rather different domatia (often well developed with a pronounced roof, but less pubescent than large domatia in the latter species), larger flowers (with petals comparable in size to those of the large-flowered *D. subviscosa* subsp. *ihosyensis*, but sepals larger), sepals that are often not reflexed even in fruit, and staminodes similar in length to filaments of

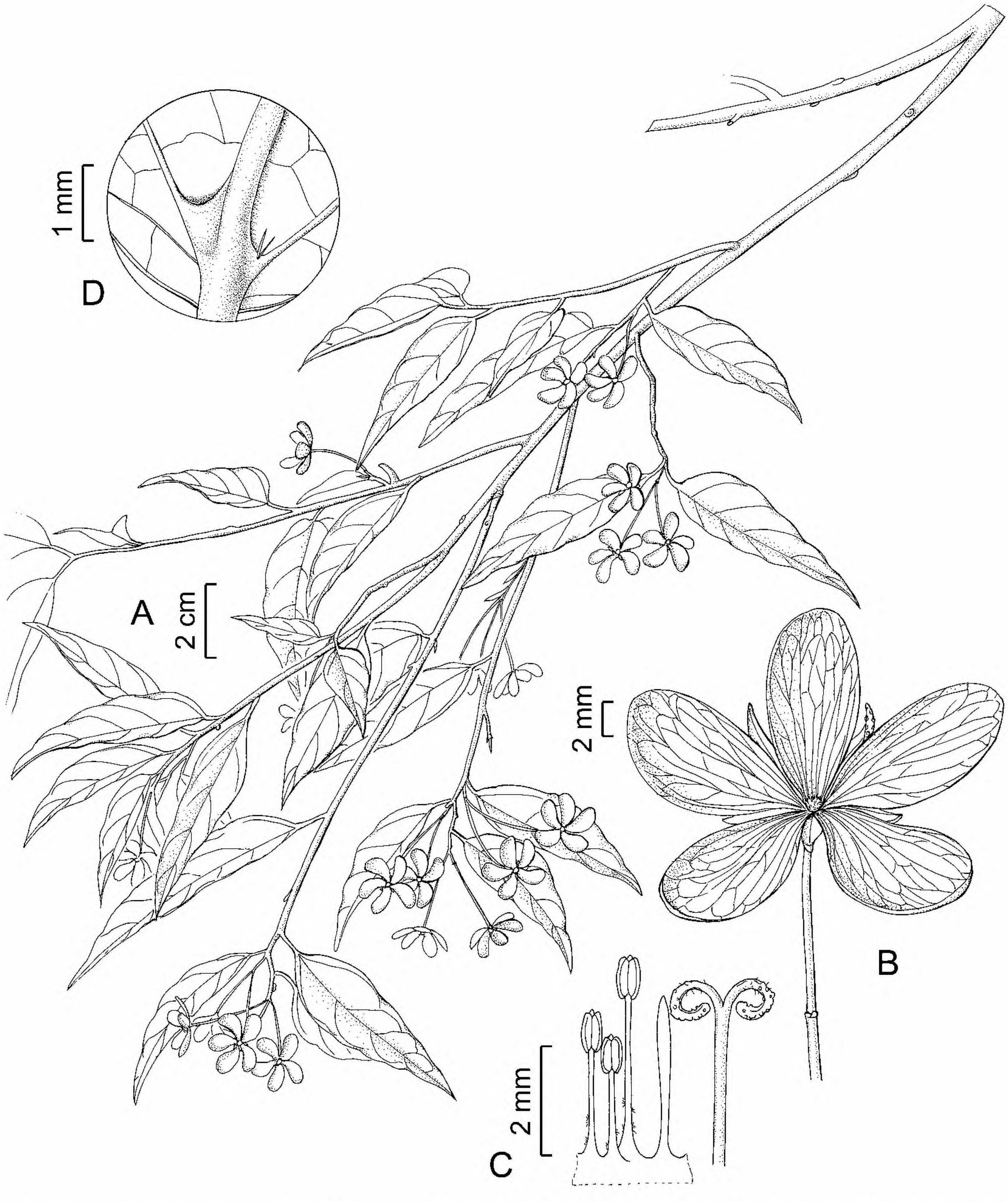


Figure 5. *Dombeya vohemarensis* Appleq. —A. Habit. —B. Corolla and calyx. —C. Androecium and style. —D. Domatia. A–D from *Rabehevitra et al. 941* (MO).

fertile stamens (rather than being conspicuously shorter as in *D. subviscosa* and other species of presumed close relationship). *Service Forestier 22702*, from a locality near Montagne des Français, is morphologically distinct from the Vohemar collections, with much broader leaves and slightly smaller flowers (which are described as "visqueuses au séchage").

Paratypes. MADAGASCAR. **Antsiranana:** sous-préfecture de Vohemar, commune rurale de Daraina, forêt d'Ampondrabe, à 630 m du point côté 594, au 97°, 12°57′47″S, 049°42′22″E, 415 m, 9 Apr. 2004 (fl., fr.), *P. Ranirison 591* (MO, P); fivondronana Vohémar, firaisana Tsarabaria, fokontany Manakana, forêt littorale d'Ambondrobe, 13°42′46″S, 50°05′25″E, 20 May 2004 (fr.), *R. Razakamalala & D. Rabehevitra 1333* (MO); bassin de la Saharaina, forêt de Sahafary, 25 Apr. 1963 (fr.), *Service Forestier 22702* (MO, P [2]).

VI. Dombeya ser. **Squamigerae** Arènes, Candollea 16: 361. 1958. TYPE: *Dombeya andrahomanensis* Arènes.

Dombeya subser. *Decaryanae* Arènes, Candollea 16: 374. 1958. TYPE: *Dombeya decaryana* Arènes.

Dombeya subsect. *Longipedicellatae* Arènes, Candollea 16: 361. 1958. TYPE: *Dombeya longipedicellata* Hochr.

Dombeya subser. *Merika* Arènes, Candollea 16: 362. 1958. TYPE: *Dombeya merika* Arènes.

Young twigs papillate, stellate, lepidote, glabrous, pilose, or scurfy; stipule scars narrow and inconspicuous or less often narrowly elliptical or narrowly crescent-shaped, then sometimes pale and somewhat prominent. Leaves elliptical to narrowly elliptical (occasionally tending to narrowly oblong-elliptical or narrowly obovate), lanceolate, or ovate (sometimes tending to rhomboid or deltoid); basal veins (1 to)5(to 7); secondary veins 3 to 9(10) or rarely numerous; domatia absent (except in *Dombeya tavia*); petioles papillate, stellate, lepidote, glabrous, or pilose. Inflorescences umbellate, few-flowered, or 1- or 2-flowered (rarely a few-flowered, usually umbelliform cyme), papillate to sparsely stellate, fimbriate-lepidote, glabrous, stellate, or partially scaly; peduncles 0.5–15(–24) mm (to 32 mm in aberrant cymose inflorescences), shorter than pedicels or rarely similar in average length. Petals broadly obovate to orbicular, obovate, or elliptical, in *D. longipedicellata* often somewhat rhomboid, near-symmetrical to strongly asymmetrical, not convex; stamens 10 to 15(to 20); staminodes ± oppositisepalous, usually longer than longest fertile filaments, rarely equal to or shorter than longest filaments; ovary stellate, glabrous, papillate, or fimbriate-lepidote.

Distribution and habitat. The species of *Dombeya* ser. *Squamigerae* occur mostly in dry forests or bush from northwestern to central and southern Madagascar at altitudes of 30–1100 m. However, two species are endemic to a high-altitude (1432–1800 m) southeastern habitat, and one, *D. merika*, is found in eastern humid forest at moderate elevations (685–900 m).

Discussion. As herein circumscribed, *Dombeya* ser. *Squamigerae* contains 11 species, including most species of Arènes' (1958) short-peduncled *Dombeya* subsect. *Longipedicellatae* that have not been placed within *Dombeya* ser. *Selinala*. As such, *Dombeya* ser. *Squamigerae* is recognized for taxonomic convenience, although it may not be monophyletic. Most of the included species have elliptical to ovate leaves, and all but one are native to relatively dry, either western to southern or high-altitudinal habitats. A plausibly natural group of five species in northwestern to central Madagascar, comprising *D. longipedicellata*, *D. pauciflora* Appleq., *D. tavia*, *D. tsiandrensis* Arènes, and *D. tubulosoviscosa* Hochr., share similar ecological conditions and morphological features. The inflorescences of most are consistently few-flowered or usually geminate, with the pedicels often dramatically longer than the pedicels, and in three species, apically thickened. The affinities of the other included species are less obvious. *Dombeya lecomtei*, with its narrowly lanceolate leaves and distinctive floral morphology, is the most problematic. It is in most ways distinct from the other species included in this series (except that it shares the very rare character of sharply bent pedicels with *D. lecomteopsis* Arènes) and is left here only to avoid describing a new series for it. All of the species included in this series, except *D. lecomtei*, are known from very few collections and appear to be rare.

Dombeya andrahomanensis was segregated by Arènes (1958) as the only species of *Dombeya* ser. *Squamigerae* because of its lepidote ovary, but this is a weak basis for the circumscription of a series, given the variability of indument in *Dombeya*. It may be conveniently treated with the other species herein included in this series because of its leaf shape and usually narrow stipule scars, short peduncles, and occurrence in dry habitats; however, it might also have affinities to *D. capuroniana* within *Dombeya* ser. *Mananarenses*. As no other series-level names were typified by members of this group, *Dombeya* ser. *Squamigerae* is the name with priority, which is regrettable as *D. andrahomanensis* is not among the distinctive core species of the group and most of the included species are not lepidote, nor are they squamate.

KEY TO THE SPECIES OF *DOMBEYA* SER. *SQUAMIGERAE*

1a. Pedicels 1.5–8.5 cm, always much longer than peduncle, the distal end conically thickened; sepals not or inconsistently reflexed; ovary glabrous or papillate; northwestern Madagascar.
  2a. Inflorescences (2)3- to 7-flowered; known material with petals 6–7.5 mm, obovate, ± symmetrical; ovary papillate ..... 41. *D. tubulosoviscosa*
  2b. Inflorescences 1- to 3-flowered or usually geminate; petals variable in size and shape, usually broadly obovate and somewhat asymmetrical or else rhomboid; ovary glabrous.
    3a. Leaves ovate to somewhat rhomboid with crenate-serrate margins; flowers (1)2; pedicels minutely papillate; petals 7–9 mm ..... 40. *D. tsiandrensis*

3b. Leaves elliptical to ovate with crenulate-serrulate margins; flowers 1 to 3; pedicels glabrous; petals 11.5–17 mm ..... 35. *D. longipedicellata*

1b. Pedicels 5–26 mm, sometimes only slightly longer than or equal to peduncle, the distal end terete or sharply bent; sepals almost always reflexed; ovary stellate or fimbriate-lepidote.

4a. Twigs, petioles, and inflorescences stellate; petals (10–)11–14 mm, often reflexed in fruit; filaments slightly longer than staminodes; northwestern Madagascar ..... 39. *D. tavia*

4b. Twigs, petioles, and inflorescences papillate (sometimes also with few stellate trichomes), fimbriate-lepidote, small-scaled, or glabrous; petals usually < 10 mm (to at least 11 mm in 1 species), not known to become reflexed; filaments almost always shorter than staminodes; south central to southeastern (eastern) Madagascar.

5a. Pedicels sharply bent beneath flower; sepals at least basally papillate with tiny reddish or pale papillae.

6a. Leaves narrowly lanceolate, margins shallowly wavy to crenate-serrate or seldom crenulate to subentire; petals usually spreading open ..... 33. *D. lecomtei*

6b. Leaves narrowly elliptical to narrowly oblong-elliptical or lanceolate-elliptical, margins finely serrulate; petals broad and often open enough to reveal androecium and gynoecium, but not conspicuously spreading; Ambatofinandrahana ..... 34. *D. lecomteopsis*

5b. Pedicels not sharply bent beneath flower; sepals bearing small scurfy to flat-stellate scales or lepidote.

7a. Twigs glabrous; leaf margins serrulate; petals on type > 9 mm, staminodes 6–6.5 mm, style 4.5–7 mm; Ambatofinandrahana ..... 32. *D. decaryana*

7b. Twigs papillate or fimbriate-lepidote; leaf margins crenate-serrulate, crenate, wavy, or subentire; petals < 9 mm, staminodes to 4 mm, style < 5 mm.

8a. Twigs and petioles densely fimbriate-lepidote; leaves narrowly elliptical to narrowly oblong-elliptical ..... 31. *D. andrahomanensis*

8b. Twigs and petioles papillate, sometimes also sparsely stellate; leaves ovate to broadly ovate, ovate-deltoid, or lanceolate.

9a. Twigs and petioles papillate with pale papillae and often sparsely stellate; leaves ovate to lanceolate with acute to rounded apices ..... 38. *D. seyrigiana*

9b. Twigs and petioles often reddish papillate, without stellate trichomes; leaves ovate to broadly ovate or ovate-deltoid with acuminate apices.

10a. Leaves ovate to broadly ovate, with (3 to)5 basal veins; stamens 10; style glabrous; ovary stellate, sometimes stellate-scaly in fruit; E humid forest ..... 36. *D. merika*

10b. Leaves ovate to ovate-deltoid, with 5 to 7 basal veins; stamens 15; style sparsely short-pubescent on most of length; ovary fimbriate-lepidote to near-stellate; S central Madagascar ..... 37. *D. pauciflora*

31. Dombeya andrahomanensis Arènes, Candollea 16: 361–362. 1958. TYPE: Madagascar. Toliara: environs d'Andrahomana, distr. de Fort Dauphin, alluvions, 4 Sep. 1924 (fr.), *R. Decary 3118* (holotype, P!; isotype, P!).

Tree; twigs pale grayish brown, the youngest lepidote with a dense coating of fimbriate scales, the leaf scars on older twigs unusually prominent; stipules caducous, lanceolate, 2.5–3.5(–6) mm, lepidote; stipule scars on young twigs small, narrowly elliptical to sublinear or seldom narrowly crescent-shaped, not distinctively colored or prominent. Leaves narrowly elliptical to narrowly oblong-elliptical, 3.5–11.6 × 1–2 cm; petiole 3–11(–16) mm, lepidote; base cuneate to rounded; apex acute with rounded tip; margins subentire to shallowly sinuate, with glands located in marginal concavities, sometimes projecting slightly; both surfaces lepidote or the upper surface bearing small scurfy stellate trichomes; basal veins 1; secondary veins numerous, weak, sometimes inconspicuous on both surfaces; domatia absent. Inflorescences 2- to 5-flowered umbels or umbelliform cymes (rarely a cyme with up to 9 flowers and elongated internal branches); peduncle 4.5–8.5 mm; pedicels 5–8 mm; peduncle and pedicels lepidote, bracteoles persistent, ovate to lanceolate, 0.6–0.9 mm, lepidote, borne immediately beneath flower or almost so. Sepals 2.5–3.5 mm, often ovate, reflexed or not, lepidote; petals white, (2.5–)3–4.8 × 2–2.5(–3) mm, broadly obovate, nearly symmetrical; corona 0.8–1 mm; stamens 15; filaments 0.5–1.2 mm; anthers 0.7–0.8 mm; staminodes spatulate, 2(–2.5) mm; style 1–1.5 mm, basally lepidote; style branches two to three, 1.3–2(–2.5) mm; ovary lepidote. Developing fruit subglobose, to 2.3 mm high, 2 mm diam., pale, lepidote; apparently 1 seed developing per locule, irregularly ovoid, somewhat compressed, to at least 1.4–1.5 mm, dark brown; mature fruit possibly dispersed as a unit leaving perianth remains.

Distribution, habitat, and phenology. *Dombeya andrahomanensis* is native to dry bush in southern Madagascar. Flowering material has been collected in February and fruits, probably immature, in March and September.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya andrahomanensis* is noted as Endangered or EN B1ab(iii)+B2ab(iii). The species is known from only

two populations, neither protected from continuing habitat loss and neither recently collected.

Additional specimens examined. MADAGASCAR. **Toliara:** massif of Angavo, E of Antanimora, *Service Forestier 11716* (P [2]); Angavo, Antanimora, *Service Forestier 14012* (P).

32. Dombeya decaryana Arènes, Candollea 16: 374–375. 1958. TYPE: Madagascar. Fianarantsoa: environs d'Ambatofinandrahana, 1600–1800 m, quartzite, 21 Feb. 1938 (fl.), *R. Decary 13173* (holotype, P!; isotypes, MO!, P!).

Small tree; twigs grayish brown, glabrous; stipules rapidly caducous, 1.5–2 mm, deltoid-acuminate, glabrous; stipule scars on young twigs narrow, not prominent. Leaves elliptical to slightly ovate, 2.9–6.3 × 1.4–3 cm; petiole (2–)6–7 mm; base ± rounded, often slightly asymmetrical; apex cuspidate to acuminate; margins serrulate with glands in apices of small rounded teeth; both surfaces glabrous; basal veins 5; secondary veins above the base 4 to 6 per side, visible on adaxial surface; domatia absent. Inflorescences 1- to 4-flowered, sometimes paired; peduncle 1–5 mm, glabrous; pedicels 8–16 mm, glabrous; bracteoles caducous, ovate, 2–3.4 mm, borne immediately below flower. Sepals 5.5–7 mm, reflexed, densely scaly with small semi-stellate scales, glandular patch sometimes possibly absent; petals white, 9–11 × 5–7(–10) mm, broadly obovate to obovate or suborbicular, nearly symmetrical; corona 1.5–2.1 mm; stamens 15; filaments 2.2–4 mm, sometimes basally fused above corona; anthers 1–1.6 mm; staminodes narrowly spatulate to linear, 6–6.5 mm; style 4.5–7 mm, long-pilose for most of its length; branches two or three, 2–3 mm, sometimes coiled; ovary somewhat laterally compressed, densely stellate with sometimes flattened multibranched trichomes.

Distribution, habitat, and phenology. *Dombeya decaryana* has been collected from the quartzite massif of Ambatofinandrahana in southeastern Madagascar, at high altitude (1600–1800 m); it flowers in February.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya decaryana* is noted as Critically Endangered or CR B1ab(iii)+B2ab(iii). The only known locality is unprotected and faces ongoing threats, and recent collectors have not relocated the species.

Discussion. *Dombeya decaryana* bears obvious close affinities to *D. lecomteopsis* (see discussion below), which is also endemic to Ambatofinandrahana; it lacks the bent pedicels seen in *D. lecomteopsis* and has longer filaments and staminodes and possibly broader leaves. It might be suspected of being a hybrid involving *D. lecomteopsis*, but no suitable second parent is known from the area.

33. Dombeya lecomtei Hochr., Candollea 3: 34–35. 1926. TYPE: Madagascar. Toliara: Ambovombe, 30 Apr. 1925 (fl.), *Decary 3722* (lectotype, designated by Arènes [1958: 377], P!; isolectotypes, G [2] not seen, G [2] images!, P [2]!).

Dombeya lecomtei [subsp. *lecomtei*] var. *valamainty* Arènes, Candollea 16: 377. 1958, syn. nov. TYPE: Madagascar. Toliara: RN XI [Andohahela], distr. Fort Dauphin, forêt sèche, 7 Feb. 1951 (fl.), *Reserves Naturelles 2749* (holotype, P!; isotypes, P [2]!, TEF not seen, TEF image!).

Dombeya lecomtei subsp. *trichostyla* Arènes, Candollea 16: 378. 1958, syn. nov. TYPE: Madagascar. Toliara: Ambovombe, 31 Jan. 1925 (fl.), *R. Decary 3544* (holotype, P!; isotypes, G not seen, G image!, K not seen, K image!).

Dombeya lecomtei var. *minoriflora* Hochr., Candollea 3: 35. 1926, syn. nov. TYPE: Madagascar. Toliara: Ambovombe [Androy], 18 Apr. 1924 (fl.), *R. Decary 2571* (holotype, P!; isotype, P [2]!).

Dombeya mandoavato Arènes, Candollea 16: 364. 1958, syn. nov. TYPE: Madagascar. Toliara: RN XI [Andohahela], canton Behara, distr. Androy, forêt sèche, 25 Jan. 1953 (fl.), *Reserves Naturelles 5022* (holotype, P!; isotypes, P!, TAN not seen, TAN image!).

Small tree, to 7(–10) m, 10 cm diam., or occasionally a shrub; twigs grayish brown, slender, the youngest bearing small irregularly shaped scales or flattened papillae, with many small protrusions at nodes where leaves were borne; stipules caducous or occasionally persistent, lanceolate, 1–2.2 mm, papillate; stipule scars on young twigs narrow, not prominent. Leaves lanceolate to narrowly lanceolate, (3.3–)5–12 × 1.2–2.5(–3) cm; petiole (3–)5–12(–16) mm, bearing small flattened, sometimes reddish papillae; base oblique to shallowly cordate or rounded; apex acuminate or rarely narrowly acute; margins shallowly wavy to irregularly crenate-serrate, crenulate-serrulate, or subentire, with brownish glands usually located at apices of teeth, less often elsewhere, prominent or embedded in margin; both surfaces, especially the abaxial, papillate with small flat, often reddish papillae; basal veins 5, the outer weak; secondary veins above base (3)4 to 7(to 9) per side, relatively conspicuous on adaxial surface; domatia absent. Inflorescences 1- to 3(to 5)-flowered, with flowers borne on a short, sometimes partly or completely divided peduncle or with peduncle essentially absent and pedicels emerging from leaf axils (rarely 2 flowers borne on a single pedicel as an

aberration); peduncle where present 0.5–6.5 mm, sometimes apically branched, sometimes bearing bracts or scars thereof midway along length, papillate; pedicels 5–13(–19.5) mm, usually sharply bent just below flower, papillate with often reddish papillae; bracteoles usually rapidly caducous, rarely persistent, oblong or ovate to lanceolate, 0.3–1 mm, papillate, borne immediately below flower. Sepals (2.8–)3.4–5.3(–6) mm, reflexed, papillate with often reddish papillae; petals white or occasionally cream, (4–)5.5–7.5(–10) × (2.7–)4–7.5(–8.5) mm, broadly obovate to orbicular, occasionally broader than long, moderately asymmetrical, usually spreading in pressed material exposing androecium and ovary; corona (0.6–)1–1.5(–2) mm; stamens 10(to 15); filaments cream, (0.8–)1.4–3.5(–5) mm, often irregularly fused above corona; anthers orange-brown, (0.6–)0.9–1.2 mm; staminodes narrowly spatulate, (1.8–)2.4–4 mm; style cream, (2–)3.5–5(–7) mm, glabrous or basally stellate, rarely short-pubescent basally; style branches 2 (very rarely to 4), possibly orange, 1–2 mm; ovary stellate, somewhat flattened. Fruit subglobose, somewhat vertically compressed, with persistent style base, to at least 3–4 mm diam., stellate; seeds 1 per fruit, immature seeds to 2 mm long, irregularly ellipsoid to broadly ovoid, pale brown; mature seeds not seen.

Distribution, habitat, and phenology. *Dombeya lecomtei* is native to dry forests, bush, and transitional forests in southern Madagascar; it has been reported on sand and gneiss at elevations of 30–900 m. It flowers from December to May (once each in June and August); fruits, generally immature, are collected from December to July.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya lecomtei* is noted as Least Concern or LC.

Vernacular names. Berehoka (*Humbert 12688*), mandoavato (*Reserves Naturelles 5022*, *Service Forestier 13789*), vala (*Boiteau 2543*, *Service Forestier 3430*, *12943*), valamainty (*Reserves Naturelles 2749*), valamena (*Service Forestier 5292*).

Discussion. *Dombeya lecomtei* is easily recognized by its narrow leaves, usually relatively conspicuous papillae on most parts (notably the pedicels), usually very broad and spreading petals, and densely stellate ovaries. It does not have obvious close affinities to any other species herein placed in *Dombeya* ser. *Squamigerae* and may prove to be more closely related to the hypothesized *Dombeya* ser. *Selinala* clade.

Dombeya mandoavato is herein synonymized with *D. lecomtei*. The former was described only from the holotype, which had unusually small and narrow petals (described by Arènes [1958, 1959] as obovate rather than obovate-suborbicular, leading to its placement in a different subseries). The holotype is in early flower and in less than ideal condition, but is identifiable as an aberrant individual of *D. lecomtei* from a locality where that species has often been collected. The infraspecific taxa described by Arènes (1958) are likewise not recognized. *Dombeya lecomtei* subsp. *trichostyla* (of which *D. lecomtei* var. *minoriflora* was stated to represent one extreme) was characterized by its basally hispid style, in contrast to the glabrous style of *D. lecomtei* subsp. *lecomtei*. The types of both were from the Ambovombe region; with the addition of further new collections, it is evident that not only are both character states frequent in that region, but that style pubescence also varies around Andohahela, in farther northern populations of the southeastern distribution, and around Ihosy (where, of two collections with intact styles, one is glabrous and one is hispid). This character seems to be rather more a matter of individual than populational variation, and as such, merits no recognition. *Dombeya lecomtei* var. *valamainty* was recognized on the basis of differences in leaf shape and margin; variation of this sort is, as far as can be determined, continuous.

There is an enormous range of variation in the size of the flowers, particularly the corolla, with some specimens having flowers almost twice the size of others, and this variation is geographically correlated. Specimens from near Ihosy, a disjunct northern portion of the distribution, always have large petals and long to very long (7 mm) styles. Three other specimens with petals 8–10 mm long come from the Ambovombe region; several other specimens from that region are slightly above average in size (petals 7–8 mm) but others are of modest size, and one (*Decary 2571*) has petals ranging from 4.5 to 8 mm on a single collection. Populations elsewhere in the southeast have petals almost always under 7 mm, but the distribution of the few specimens with extremely small flowers is not reliable (e.g., petals from 4.5 to 6.5 mm are seen at Bevilany, and from 5 to 7 mm at Eromo), indicating that while genetic variation in size does have some geographic structure, the extreme variants do not occur solely as isolated populations, but co-occur with more average individuals. Formal taxonomic recognition of this variation, therefore, does not seem possible at this time, although with more samples from Ihosy that variant might prove to be separable.

Additional specimens examined. MADAGASCAR. **Fianarantsoa:** Amboloandro, near Belomboany and Zazafotsy, *Perrier de la Bâthie 2186* (P); Andrandohy S of Ambinda (PK 32, rte. Ihosy–Ivohibe), *Service Forestier 22612* (P [2]); near crossroads of routes from Ihosy to Ivohibe and Iakora, *Service Forestier 22628* (P [2]). **Toliara:** Marovato, *Boiteau 2543* (P); Beraketa, *Bosser 17845* (MO, P [2]); Rte. 10, 16 km W of Manambaro, *Croat 31945A* (P); Fort Dauphin, *Debray s.n.* (P); Ambovombe, *Decary 2542* (MO, P), *2768* (P), *2993* (P [2]), *8554* (MO, P [2]), *8580* (MO, P [3]), *9076* (MO, P [2]), *9542* (P); Irakoka, E of Ambovombe, *Decary 9613* (MO [5], P); S of Betioky, *Guillaumet 2485* (P); s. loc., *Homolle 1752* (P [2]); middle valley of the Mandrare near Anadabolava, *Humbert 12688* (P [2]); mountains between Andohahela and Elakelaka, between Ampahiso and Mahamavo, *Humbert 13716* (P [3]); Mont Eromo near Beraketa, *Humbert 14176* (P), *14177* (P); along RN 13, PK449, 42 km W of Fort Dauphin, 25°01′20″S, 046°38′55″E, *Lowry et al. 5032* (MO); Ambovombe, forest 3 km E of town, 25°09′30″S, 046°08′10″E, *Phillipson & Bürki 5821* (P); Andohahela, parcelle 3, *Phillipson & Milijaona 3518* (MO, P); Anosy, Ranopiso, 1.8 km SW of Ankilivalo, *Rakotovao et al. 5485* (MO); Andohahela RNI, parcelle 3, *Randriamampionona 133* (MO, P); Andohahela, parcelle 2, *Randriambololona et al. 87* (MO, P); Sasaké, Ambovombe, *Service Forestier 3430* (P); Anjiozio, Vohimainty, Behary, *Service Forestier 5292* (MO, P [3]); massif of Angavo, E of Antanimora, *Service Forestier 11721* (P [3]); Angavo, Antanimora, Ambovombe, *Service Forestier 12943* (P [2]); Bevilany (between Amboasary and Ranopiso), *Service Forestier 18697* (P [3]); E of Ambovombe, *Service Forestier 20441* (MO, P [2]); Bevilany, E of Amboasary, *Service Forestier 20493* (MO, P); massif of Vohipary NW of Andalatunisy (Antanimora), *Service Forestier 22499* (MO, P), *22505* (MO, P [2]); massif of Vohidava near Anadabolava, *Service Forestier 22590* (MO, P).

34. Dombeya lecomteopsis Arènes, Candollea 16: 376–377. 1958. TYPE: Madagascar. Fianarantsoa: environ[s] d'Ambatofinandrahana, 1600–1800 m, quartzite, 21 Feb. 1938 (fl.), *R. Decary 13135* (holotype, P!; isotype, P!).

Tree to 10 m; twigs brown to grayish brown, the youngest minutely papillate; stipules rapidly caducous, 1.5–2 mm, deltoid-acuminate to lanceolate, sparsely papillate; stipule scars on young twigs narrow, not prominent; base convex to rounded, usually slightly asymmetrical. Leaves narrowly elliptical to narrowly oblong-elliptical to somewhat lanceolate or narrowly obovate, 4.5–9.5 × 1.5–3.3 cm; petiole 6–13 mm, sparsely papillate to glabrous; apex acuminate or occasionally rounded; margins serrulate with glands in apices of small rounded teeth; abaxial surface minutely papillate with often reddish papillae, adaxial surface sparsely papillate to glabrate; basal veins 3 to 5, all weak, often asymmetrical; secondary veins above the base 7 to 9 per side, visible on adaxial surface; domatia absent. Inflorescences (1)2- to 4-flowered, often 2(3) per node; peduncle 1–6 mm, minutely papillate, sometimes apically short-branched; pedicels 8–14 mm, usually sharply bent just below flower, minutely papillate; bracteoles rapidly caducous, narrowly oblong, ca. 1.5 mm, borne immediately below flower and leaving a prominent fluted scar on the side of the receptacle opposite the pedicel. Sepals 5–6 mm, reflexed, minutely papillate at least at base; petals white, 8.6–10 × 5.5–10 mm, broadly obovate to obovate or suborbicular, slightly to moderately or less often strongly asymmetrical; corona 2–3 mm; stamens 15 to 20; filaments white, 0.7–2(–2.5) mm; anthers 1.6–2 mm; staminodes narrowly spatulate, 2.8–4 mm; style 4–5.3 mm, pilose or at least bearing a few straight trichomes near base; branches 2, white, 2–2.5 mm, coiled; ovary somewhat laterally compressed, densely stellate, containing globules of gelatinous matter.

Distribution, habitat, and phenology. *Dombeya lecomteopsis* has been collected from the quartzite massif of Ambatofinandrahana in southeastern Madagascar, in dry forest at high altitude (1432–1800 m); it flowers in February and March.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya lecomteopsis* is noted as Critically Endangered or CR B1ab(iii)+B2ab(iii). The only known locality is unprotected and faces ongoing threats; label data from the most recent collection (*Skema 52*) noted that the plant was found in a forest relic bordered by cultivated land and savannahs.

Discussion. *Dombeya decaryana* and *D. lecomteopsis* were described by Arènes (1958) from two Decary collections made around Ambatofinandrahana (a seldom collected locality) on the same day. The two share similar morphology, including both general appearance and unusual derived characters such as a long-pubescent style, and are undoubtedly closely related. *Dombeya lecomteopsis* has bent pedicels like those of *D. lecomtei*, suggesting a close relationship to that species as well, while *D. decaryana* does not. The androecium and gynoecium of *D. lecomteopsis* are smaller than those of *D. decaryana* except for longer anthers (in particular, the staminodes are 2.8–4 mm vs. 6–6.5 mm), and the sepals bear minute papillae rather than scurfy-stellate scales. Leaves of *D. lecomteopsis* may be somewhat narrower and have more secondary veins. The possibility that *D. lecomteopsis* represents a first-generation hybrid of *D. decaryana* × *D. lecomtei* is rejected because *D. lecomtei* is not known from the area nor known to occur above 900 m, and because the second collection now identified as *D. lecomteopsis* is morphologically very consistent with the type.

Additional specimens examined. MADAGASCAR. **Toliara:** Amoron'i Mania, 7 km NNE of Ambatofinandrahana village, *Skema 52* (MO [2]).

35. Dombeya longipedicellata Hochr., Candollea 3: 32–33. 1926, as "*longepedicellata*." TYPE: Madagascar. Mahajanga: rocailles calcaires et boisées de Vilanandro près d'Andranomavo (Ambongo), Aug. 1905 (fl.), *H. Perrier de la Bâthie 5516* (holotype, G not seen, G image!; isotype, P!).

Shrub, to at least 4 m, or tree; twigs grayish brown, the youngest stellate with small thin trichomes or pilose; stipules caducous, linear to very narrowly deltoid, 2.5–4(–8) mm, sparsely pubescent; stipule scars on young twigs very narrowly elliptical, pale, not prominent. Leaves elliptical to ovate, 5.5–13.5 × 2.4–6 cm; petiole 2–5 mm, thin-stellate or pilose; base ± rounded or rarely shallowly cordate; apex acuminate or rarely cuspidate or acute; margins irregularly crenulate to serrulate with inconspicuous glands variably located in tooth apices or between teeth; both surfaces sparsely small-stellate or more densely pilose, at least along veins; basal veins 5(rarely 7); secondary veins above the base 5 to 9 per side, inconspicuous on adaxial surface; domatia absent. Inflorescences 1- to 3-flowered; peduncle 3–15(–23) mm, glabrate with a few small stellate trichomes; pedicels (4–)5–7(–8.5) cm, glabrous; bracteoles very early caducous, linear, 1.5 mm, glabrate; at anthesis uppermost part of pedicel thickened, at least one bracteole scar slightly below flower, bracteole scars not all at the same level. Sepals 6.2–7.5(–11.5) mm, narrow, not reflexed, glabrous; petals white, at least sometimes purplish red at the base, 11.5–17 × 7.5–11.5 mm, broadly obovate, usually asymmetrically, or somewhat rhomboid with rounded apex and symmetrical; corona 1.5–3 mm; stamens 10 to 15; filaments (0.5–)1.5–3 mm; anthers 1.4–2.1 mm; staminodes linear, 3–6 mm; style 5–9 mm; style branches two, 1–1.5 mm; ovary glabrous. Immature fruit subglobose, to at least 3.3 mm diam., dark brown, wrinkled; mature fruit not seen.

Distribution, habitat, and phenology. *Dombeya longipedicellata* is native to dry forests of northwestern Madagascar on limestone. It flowers from August through December; immature fruit has been collected in December.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya longipedicellata* is noted as Endangered or EN B1ab(iii)-2ab(iii). Fewer than five historical populations are known, there have been no recent collections, and potential habitat is almost all unprotected and subject to continuing degradation.

Vernacular name. Mabolotsaky (*Reserves Naturelles 11445*).

Discussion. *Dombeya longipedicellata* displays unusual variability in pubescence: most specimens have a modest indument of thin stellate trichomes on most parts of the plant, whereas two have a somewhat heavier coating of long unbranched trichomes mixed with few stellate trichomes, a type of pubescence that is very unusual in this group. These specimens include one of the two fragments on the type sheet and one other collection from Andranomavo. Because this variation apparently occurs or did occur within a single population and is not consistently correlated with variation in other morphological characters, formal taxonomic recognition would be inappropriate.

Hochreutiner (1926) published this species as *Dombeya longepedicellata*; the use of an inappropriate compounding form is treated as an error to be corrected (Art. 60.8 of the ICN; McNeill et al., 2012). Arènes (1958) declared the duplicate of the only cited collection, *Perrier de la Bâthie 5516*, at P to be the lectotype, but the duplicate at G should be considered to be the holotype. Hochreutiner did not indicate that the specimen he saw came from another herbarium (see discussion under *D. aquifoliopsis*), and the quoted label data did include the words "de Vilanandro," which are omitted from the P duplicate's label, demonstrating that Hochreutiner had used the G duplicate.

Leaves are usually small and not fully mature at anthesis and have been reported to be caducous (*Perrier de la Bâthie 17831*). The wood is reported to be hard and used for construction (*Reserves Naturelles 7742*).

Additional specimens examined. MADAGASCAR. **Mahajanga:** Namoroka (Ambongo), *Perrier de la Bâthie 17831* (P); s. loc., s.d., *Petit s.n.* (P); Andranomavo, Soalala, *Reserves Naturelles 6858* (P); Ankoakibe, Andranomavo, Soalala, *Reserves Naturelles 7742* (MO, P [3]), *11445* (P [2]).

36. Dombeya merika Arènes, Candollea 16: 362–363. 1958. TYPE: Madagascar. Toamasina: forêt d'Ambodiala, à 7 km au S d'Andilamena, 685 m, 8 May 1942 (fl., fr.), *G. Cours 1663* (holotype, P!; isotypes, P!, TAN not seen, TAN image!).

Dombeya coursii Arènes, Candollea 16: 375–376. 1958, syn. nov. TYPE: Madagascar. Toamasina: distr. d'Ambatondrazaka, s.d. (fl.), *Cours 275* (holotype, P!; isotype, P!).

Tree to 20 m, to 30 cm diam.; twigs grayish or reddish brown, the youngest bearing minute flattened, sometimes reddish papillae; stipules caducous, ca. 1 mm, possibly ovate, papillate to glabrate; stipule scars on young twigs narrow, not prominent. Leaves ovate to broadly ovate, 3.5–8.6 × 2–3.8(–4.3) cm; petiole (4–)6–11 mm, papillate; base rounded to shallowly cordate; apex acuminate; margins irregularly crenulate or shallowly wavy to subentire, with glands borne in concave portions, usually sunken, occasionally prominent; both surfaces sparsely flat-papillate, especially along veins, to glabrous; basal veins (3 to)5; secondary veins above base (3)4 to 8 per side, variably curving or nearly straight, sometimes apparently craspedodromous, in mature leaves sometimes not visible on adaxial surface; domatia absent. Inflorescences 1- to 3(to 7)-flowered, occasionally a 4-flowered umbelliform cyme, rarely a several-flowered cyme with elongated internal branches; peduncle 0.5–11 mm, papillate to glabrate; pedicels 9–19(–25) mm, papillate, sometimes scaly stellate on uppermost portion above attachment of bracteoles; bracteoles very rapidly caducous, not seen, the scars at anthesis well below flower. Sepals 3.2–5.3 mm, reflexed, scurfy to scaly stellate; petals white, (4.5–)6–8.2 × (2.6–)4–5(–6) mm, broadly obovate to elliptical, ± asymmetrical; corona (1–)1.3–1.8(–2.8) mm, at least somewhat narrowed above ovary and occasionally reflexed; stamens 10; filaments white, 0.8–2.4 (–3) mm, sometimes irregularly fused above corona; anthers rust colored or yellow, 0.7–1.1 mm; staminodes narrowly spatulate, 2.5–3.5 mm; style (2.5–)3.5–4.7 mm; style branches 2(3), green, 1–1.5 mm, spreading; ovary stellate. Fruit subglobose, slightly laterally compressed, 2.5–3.2 mm diam., dark or pale brown with sparse stellate or stellate-scaly indument; immature seeds 1 per fruit, dark brown, irregularly shaped and very deeply wrinkled, but not significantly compressed; mature seeds not seen.

Distribution, habitat, and phenology. *Dombeya merika* is primarily native to humid forests of eastern Madagascar, at elevations of 685–900 m; it has been reported to occur on sandy soil and along riverbanks. One collection reportedly comes from the western region of Ambohijanahary, on the border between Mahajanga and Toliara provinces; as forest in that area would be much drier, this location seems suspicious and should be further investigated if possible. It flowers from April to August; immature fruit has been collected from May to August.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya merika* is noted as Vulnerable or VU, D. Most of the five known locations are close together and vulnerable to stochastic events, though some are protected.

Vernacular names. Hafotra merika (*Service Forestier 3531, 16877*), merika (*Service Forestier 26789*).

Discussion. The type of *Dombeya coursii* has larger leaves than other existing collections but is clearly conspecific with *D. merika*; the leaf morphology is distinctive enough to distinguish this species from most others. The two names have equal priority; *D. merika* is preferred because its type, though unusually small flowered, is in better condition and has better locality data, and *D. merika* has been the name more commonly used in the herbarium.

The wood is used for construction (*Service Forestier 26789*).

Additional specimens examined. MADAGASCAR. **Toamasina:** NE of Moramanga, *McPherson 17148* (MO); Antsahatsaka, Périnet, *Service Forestier 3531* (P); Antamiditra, Périnet, Moramanga, *Service Forestier 16877* (MO, P); Andranomandry, Moramanga, *Service Forestier 26789* (P). **Unknown locality:** forest of Ankitsika, canton of Ambohijanahary, *Cours* [*Herb. Inst. Sci. Mad.*] *1585* (MO, P [2]); s. loc., *Keraudren 1147* (P).

37. Dombeya pauciflora Appleq., sp. nov. TYPE: Madagascar. Fianarantsoa: berges de la rivière Ilempona, à 6 km à l'W d'Ihosy à la base du plateau de l'Horombe, 23 Feb. 1970 (fl.), *Service Forestier 29075* (holotype, P!; isotype, P!). Figure 6.

Diagnosis. Differs from *Dombeya tsiandrensis* Arènes in having often ovate-deltoid leaves with broader base, consistently acuminate apex; sparsely and minutely papillate indument on the twigs, petioles, leaves and peduncles; sepals fimbriate-lepidote, reflexed; ovary fimbriate-lepidote to nearly stellate.

Small tree, to 5–6 m; twigs grayish brown, the youngest sparsely papillate with minute flat reddish papillae; stipules caducous, lanceolate, (1.6–)2.9–3.2 mm, papillate; stipule scars on young twigs narrow, not prominent. Leaves ovate to ovate-deltoid, (2.8–)3.5–5.5 × 1.9–3 cm; petiole (4.5–)7–12 mm, reddish papillate; base shallowly cordate, broad with sometimes nearly rounded-truncate appearance; apex acuminate; margins irregularly crenate, with teeth often shallow, occasionally large and rounded, or shallowly wavy, with glands borne in apices of teeth or in concavities between teeth; both surfaces at least sparsely papillate with minute flat reddish papillae; basal veins 5 to 7, the outermost weak; secondary veins above the base 3(4) per side, visible on adaxial surface; domatia absent. Inflorescences 1- or 2-flowered; peduncle

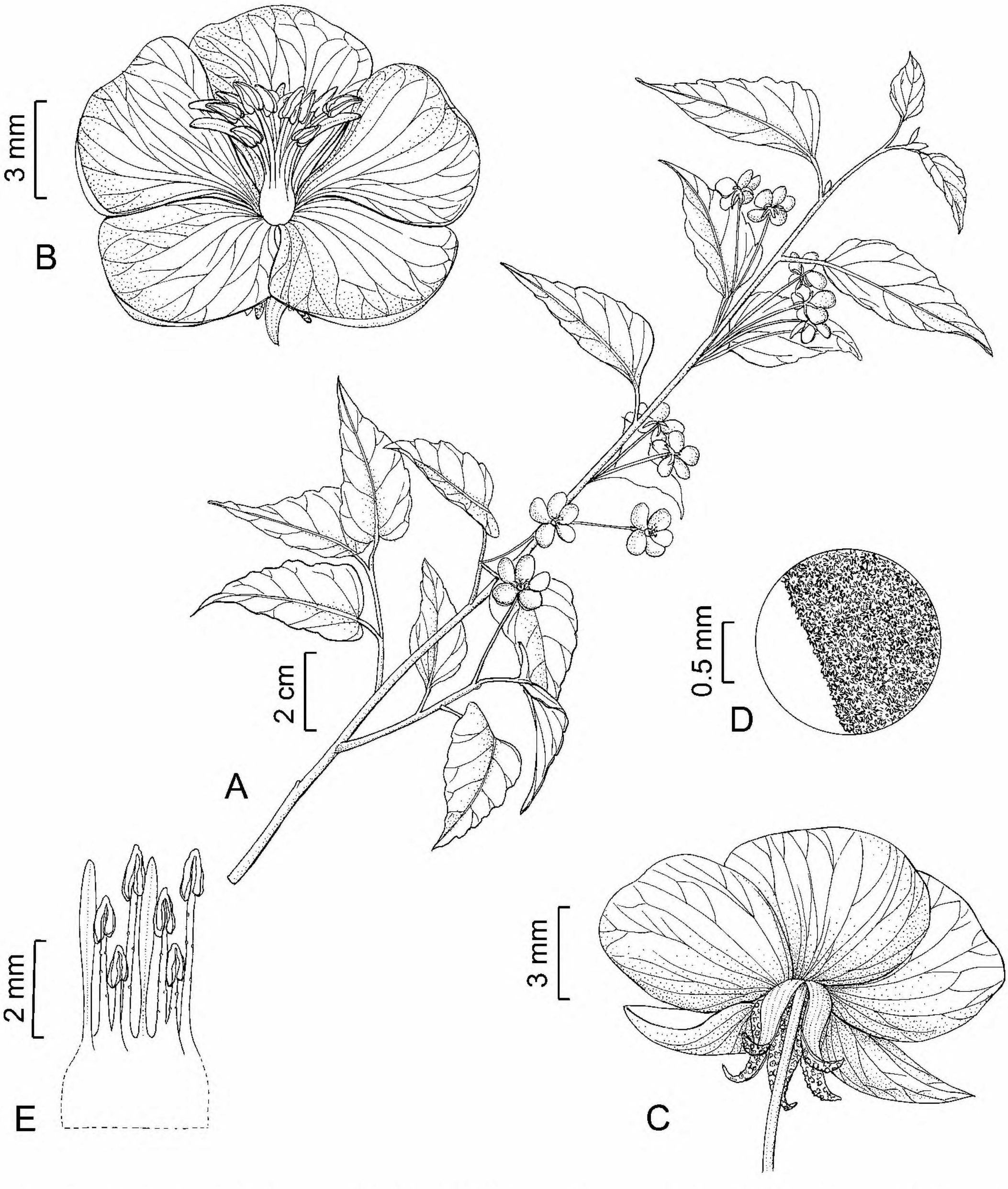


Figure 6. *Dombeya pauciflora* Appleq. —A. Habit. B–C. Flower. —D. Indument of abaxial sepal surface. —E. Androecium. A–E from *Service Forestier 29075* (P).

5.5–12.5 mm; pedicels 1.9–2.6 cm; peduncle and pedicels bearing minute, often reddish flattened papillae, the pedicels above the bracteole scars bearing scaly indument like that of sepals; bracteoles very rapidly caducous, broadly elliptical and enclosing young buds, ca. 1.5 mm, papillate; bracteole scars at maturity somewhat below flower. Sepals 4–5 mm, reflexed, with small raised irregularly fimbriate scales; petals 6–7 × 5.4–6.5 mm, suborbicular, slightly asymmetrical; corona 1–1.5 mm; stamens 15; filaments 1.5–3 mm, partly fused above corona; anthers 0.8 mm; staminodes spatulate, 3.5–4 mm; style 4.5 mm, with few small straight white trichomes over most of length; branches 2, 1 mm; ovary lepidote to semi-stellate, with an indument of small flat-stellate scales. Developing ovary subglobose, to at least 2.4 mm diam., lepidote; mature fruit not seen.

Distribution, habitat, and phenology. *Dombeya pauciflora* has been collected from a single locality in southern Madagascar, on a riverbank near Ihosy; it flowers in February.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya pauciflora* is noted as Critically Endangered or CR B1ab(iii)-2ab(iii). The type locality is not protected and has suffered severe habitat degradation; although the area is quite accessible, no more recent collections have been made.

Discussion. Superficially, *Dombeya pauciflora* most resembles *D. tsiandrensis*, which has a similar general appearance and usually geminate, long-pedicelled inflorescences. However, it is distinguished from that species by details of leaf shape and floral morphology and by differences in the indument on all parts. Although *D. tsiandrensis* is somewhat stellate on the twigs, leaves, and peduncles but has papillate sepals and a glabrous ovary, *D. pauciflora* has papillate indument on the twigs, leaves, and peduncles but fimbriate-lepidote indument on the sepals and ovary. It also lacks a derived character shared among *D. tsiandrensis* and two similar northwestern species, prominent apical thickening of the pedicel. Although only one specimen is known, it can be confidently identified as a new taxon and not a hybrid, because its locality is far to the south of the only known historical population of *D. tsiandrensis*.

This species' true affinities might be with *Dombeya merika*, the only species of this group that is native to eastern humid forests in Madagascar, which does not share the character of thickened pedicels. The leaves of *D. merika* have only (three to) five rather than five to seven basal veins and do not tend to be deltoid ovate nor ever have large prominent marginal teeth; *D. merika* has only 10 stamens and a glabrous style, and its ovary is generally stellate at anthesis, though taking on a flat-stellate appearance in fruit.

The epithet of *Dombeya pauciflora* reflects the fact that the inflorescences are consistently 1- or 2-flowered. It is unrelated to Arènes' (1958) *Dombeya* subser. *Pauciflorae*, a subgroup within *Dombeya* subg. *Dombeya*, which was not derived from a validly published specific epithet within that subgroup and, lacking citation of a type species, was not validly published, as was the case for a number of Arènes' infrageneric groups, as previously noted.

38. Dombeya seyrigiana Arènes, Candollea 16: 394. 1958. TYPE: Madagascar. Toliara: Ampandrandava, crêtes à l'Est, entre Bekily et Tsivory, vers 1100 m, Apr. 1943 (fr.), *A. Seyrig 616* (holotype, P!; isotype, P!).

Small tree or shrub; twigs grayish brown, young twigs papillate with occasional small stellate trichomes; stipules caducous, lanceolate to linear, 2–3.5 mm; stipule scars on young twigs narrow, not prominent. Leaves ovate to lanceolate, 3.5–8.2 × 1.8–3.6 cm; petiole 3–8(–16) mm, usually papillate, with occasional stellate trichomes; base rounded to very shallowly cordate; apex acute or rarely rounded; margins irregularly crenate to crenulate-serrulate, with glands in tooth apices or on apical margins of teeth or between teeth; abaxial surface sparsely papillate, often with few small stellate trichomes along main veins; adaxial surface glabrous or glabrate, with rare single stellate trichomes; basal veins 5(rarely 3), the outermost weak; secondary veins above the base 4 to 7 per side, tending to craspedodromous, inconspicuous but visible on adaxial surface; domatia absent. Inflorescences 1- to 6-flowered; peduncle 6–14(–24) mm; pedicels 7–13 mm, sometimes about equal to peduncle in length; peduncle and pedicels usually inconspicuously papillate, often with few small stellate trichomes; bracteoles caducous, linear to narrowly lanceolate, (1.5–)3.5–4 mm, papillate, borne immediately below flower. Sepals 3.6–4.8 mm, usually reflexed after anthesis, with scurfy indument; petals white, 6–8 × (4–)5.5–7 mm, broadly obovate, conspicuously asymmetrical; corona 0.8–1.3 mm; stamens 15; filaments 0.5–1.5 mm; anthers 0.8–1 mm; staminodes narrowly spatulate to sublinear, 2–3.5 mm; style 2.5–3.5 mm; branches two, 1–1.5(–2.5) mm; ovary stellate. Fruit subglobose, to 4 mm diam., reddish brown, sparsely stellate; seeds 2 per fruit, apparently only 1 developing, irregularly elliptical, slightly laterally compressed, to at least 2.3 × 2 mm, dark reddish brown.

Distribution, habitat, and phenology. *Dombeya seyrigiana* is native to dry areas in southern Madagascar; it occurs on gneiss at reported altitudes of 800–1100 m. Flowers and possibly immature fruits have been collected in April.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya seyrigiana* is noted as Endangered or EN B1ab(iii)+2ab(iii). It is known from only two localities, neither protected, and has not been relocated in several decades despite more recent botanical collections of remaining natural vegetation in the regions where it was known to occur.

Discussion. *Dombeya seyrigiana*, which has peduncles equaling or exceeding the pedicels, was placed by Arènes (1958) within *Dombeya* subsect. *Decantherae*; however, its vegetative morphology and ecological preferences seem to place it more plausibly within this otherwise short-peduncled series.

Additional specimens examined. MADAGASCAR. **Toliara:** Mont Eromo near Beraketa, *Humbert 14187* (P); Ampandrandava between Bekily and Tsivory, *Seyrig 616B* (P [2]).

39. Dombeya tavia Arènes, Candollea 16: 368–369. 1958. TYPE: Madagascar. Mahajanga: Andakana, Maevatanana, 27 Jan. 1951 (fr.), *Service Forestier 3960* (holotype, P!; isotypes, MO!, P!, TAN not seen, TAN image!, TEF not seen, TEF image!).

Woody plant; twigs grayish brown, the youngest at least sparsely stellate-pubescent; stipules not seen; stipule scars on young twigs narrow, not prominent. Leaves lanceolate to ovate, 5.5–10.5 × 2.5–4.3 cm; petiole 6–12(–16) mm, stellate; base rounded to cuneate and rounded at the very base; apex acuminate; margins shallowly serrate, bearing small rounded projections in which glands are located, occasionally also irregularly dentate; abaxial surface sparsely stellate-pubescent, adaxial surface sparsely stellate-pubescent, mostly along midrib, or bearing sparse minute papillae or glabrous; basal veins 5, the outermost weak; secondary veins above the base 5 or 6 per side, tending to craspedodromous (sometimes terminating in notches between teeth, especially apically), visible on adaxial surface; domatia present both basally and in juncture of some secondary veins with midrib above the base. Inflorescences few-flowered, usually only 1 flower per inflorescence developing fruit, sometimes 3-branched at base so barely cymose; peduncle 1–3 mm; pedicels 12–20 mm; peduncle and pedicels stellate; bracteoles not seen, bracteole scars close to flower. Sepals 7–8 mm, reflexed, stellate, usually persistent in fruit; petals (10–)11–14 × (4.5–)6–8 mm, obovate, cuneate with broad base, nearly symmetrical, often somewhat reflexed in fruit but usually not to an extreme degree; corona 3 mm, possibly narrowed above ovary in flower; stamens 15; filaments 6.5–7 mm; anthers 1.2–1.3 mm; staminodes linear, 6 mm; ovary stellate. Immature fruit subglobose, to 6 mm diam., dark with whitish persistent indument; seed to at least 3 mm, elliptical, dark brown, glossy, possibly only 1 per fruit developing.

Distribution and habitat. *Dombeya tavia* is native to the vicinity of Andakana, south of Maevatanana in northwestern Madagascar, presumably in dry forest.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya tavia* is noted as Data Deficient or DD. The habitat is unprotected and subject to ongoing degradation, and no re-collections have been made; it may be critically endangered. However, it is not entirely certain that *D. tavia* is a distinct species (see discussion below).

Vernacular name. Tavia.

Discussion. Within the apparently cohesive but very poorly collected group of northwestern to north-central species of *Dombeya* ser. *Squamigerae*, *D. tavia* is remarkable for having domatia in the axils of basal and secondary leaf veins (domatia being otherwise unknown in this series), very long filaments that slightly exceed the also long staminodes in length and petals that are often somewhat reflexed in fruit. Potentially, the type of *D. tavia* could represent a hybrid of *D. longipedicellata* (the only known large-flowered potential parent) × *D. subviscosa* (a common species in the region that usually has domatia, sometimes multiple pairs, and stamens that are longer than the staminodes). Both putative parents usually have at least slightly longer peduncles, and neither has reflexed petals, although hybridization involving a concave-petalled parent perhaps could result in irregularly reflexed petals. *Dombeya subviscosa* has stellate ovaries (at least post-anthesis) and occasionally stellate inflorescences, although normally never stellate sepals. However, *D. longipedicellata* has a limited known range and has never been collected in the vicinity of the type of *D. tavia*. Furthermore, known collections of *D. longipedicellata* flowered from August, perhaps atypically, through December, while *D. subviscosa* normally flowers from January to May. This phenological difference might make hybridization less likely. Lacking adequate material of this group to clarify species boundaries, continued tentative recognition of previously described taxa of uncertain status is the most conservative approach.

40. Dombeya tsiandrensis Arènes, Candollea 16: 382–383. 1958. TYPE: Madagascar. Mahajanga: plateau de Bemaraha, forêt de Behandrao, au S de Tsiandro, restes de forêt à feuilles caduques sur buttes calcaires, 500–600 m, 29 Nov. 1952 (fl.), *R. Capuron, J. Leandri & A. Razafindrakoto 1980* (*Service Forestier 6765*) (holotype, P!; isotypes, MO [3]!, P!, TAN not seen, TAN image!, TEF not seen, TEF image!).

Small tree, to 7 m, 15 cm diam., or possibly large shrub; twigs dark brown, the youngest stellate-pubescent with lax white trichomes; stipules caducous, lanceolate-acuminate to sublinear, 2–4.5 mm,

sparsely stellate; stipule scars on young twigs linear to slightly broadened, often pale and modestly prominent, often subtended by tufts of stellate trichomes. Leaves ovate, occasionally somewhat rhomboid, (3–) 5–8.8 × 2–3.5 cm; petiole 3–6 mm, at least sparsely stellate; base rounded; apex acuminate to acute with a rounded tip; margins crenate-serrate with large rounded teeth; abaxial surface sparsely stellate-pubescent, with scattered trichomes mostly along main veins; adaxial surface glabrous or glabrate; basal veins 5; secondary veins above the base 3 or 4 per side, pale and relatively weak but visible on adaxial surface; domatia absent. Inflorescences (1)2-flowered; peduncle 1.6–4(–5.5) mm, sparsely stellate; pedicels (3.6–)5.5–8.5 cm, bearing minute, often reddish flattened papillae; bracteoles caducous, ovate, thick, 0.5–1 mm, bracteole scars at anthesis prominent, borne somewhat below flower with the uppermost part of the pedicel thickened conically. Sepals 4–4.7 mm, not reflexed, glabrate with minute papillae beneath, rare single stellate trichomes; petals white, 7–9 × 5.7–7 mm, broadly obovate to suborbicular, moderately asymmetrical; corona 2.5–3 mm; stamens 15; filaments 0.5–1.5 mm; anthers 1 mm; staminodes linear, 3–4 mm; style 5–5.5 mm; branches two, 1.2–1.5 mm; ovary glabrous.

Distribution, habitat, and phenology. *Dombeya tsiandrensis* is native to dry forest on limestone near Tsiandro in northwestern Madagascar, at 500–600 m; flowering material was collected in November.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya tsiandrensis* is noted as Critically Endangered or CR B1ab(iii)-2ab(iii). The species is native to unprotected and badly degraded northwestern habitat, and it has not been relocated by more recent collectors in that region.

Discussion. The type of *Dombeya tsiandrensis* is numbered on four duplicates in Leandri's collector series, rather than Capuron's, but Capuron (who was also collecting for Service Forestier) is indicated on Leandri's printed labels as the first collector.

41. Dombeya tubulosoviscosa Hochr., Candollea 3: 37–38. 1926. TYPE: Madagascar. Mahajanga: environs de la baie de Bombetoka, bois rocailleux (calcaire), [Dec. 1907] (fl.), *H. Perrier de la Bâthie 12165* [*H. L. Jumelle 45*] (lectotype, designated by Arènes [1958: 388], P!; isolectotypes, G not seen, G image!, K [2] not seen, K [2] images!).

Dombeya majungensis Arènes, Candollea 16: 383–384. 1958, syn. nov. TYPE: Madagascar. Mahajanga: environs de Majunga, 2–15 m, restes de forêts, sur calcaire, 28–30 Dec. 1924 (fl.), *H. Humbert 4090* (holotype, P!; isotype, P!).

Sarmentose shrub; twigs grayish brown, young twigs brown, sparsely reddish stellate; stipules caducous, lanceolate-acuminate, 2–3.5 mm, sparsely stellate to glabrate; stipule scars on young twigs narrow, not prominent. Leaves elliptical to ovate or lanceolate, 4–10.5 × 1.7–3.9 cm; petiole 4–9 mm, stellate; base rounded; apex acuminate; margins crenulate to crenulate-serrulate, with glands variously located in or distally to teeth apices; abaxial surface sparsely stellate, especially along veins, or rarely glabrous; adaxial surface glabrate or glabrous to sparsely stellate; basal veins 5 or occasionally 7 with the outermost very weak; main secondary veins above base 6 to 10 or more, sometimes scarcely distinguished from interspersed smaller veins, visible on adaxial surface; domatia absent. Inflorescences (2)3- to 7-flowered; peduncle 0.5–1.5(–3) mm, sparsely stellate; pedicels 1.5–3.8 cm, glabrous; bracteoles caducous, not seen, bracteole scars slightly or rarely immediately below flower with the uppermost part of the pedicel strongly thickened. Sepals 3.5–4 mm, variably reflexed or not; petals white, 6–7.5 × 4–4.8 mm, obovate, symmetrical; corona 2–2.4 mm; stamens 15; filaments 0.8–2 mm; anthers 1–1.2 mm; staminodes 1.8–2.8 mm; style 4–5.5 mm; branches two, 1 mm; ovary flattened, papillate. Fruit subglobose, to 3 mm diam., dark brown, minutely papillose; 1 seed per fruit maturing, broadly ellipsoid to 2.8 mm with deep irregular wrinkles, dark reddish brown with minutely striated surface.

Distribution, habitat, and phenology. *Dombeya tubulosoviscosa* is native to dry forests of northwestern Madagascar, on limestone; it is known to flower in December and fruit in February.

IUCN Red List category. Preliminary IUCN Red List category (IUCN, 2001) for *Dombeya tubulosoviscosa* is noted as Endangered or EN B1ab(iii)-2ab(iii). Two historical localities are known, neither protected and both subject to anthropogenic degradation; as for other northwestern species in this series, no recent collections have been made despite the accessibility of much of the remaining potential habitat.

Discussion. Hochreutiner (1926) cited two collections of *Dombeya tubulosoviscosa*, *Perrier de la Bâthie 1240* and *Jumelle 45* from Hb. Perrier de la Bâthie (which is also numbered on most herbarium

labels as *Perrier de la Bâthie 12165*). Arènes (1958) incorrectly described the former as a paratype and the P duplicate of the latter as the holotype; however, this is a correctable error under Article 9.9 of the ICN (McNeill et al., 2012), and Arènes thus lectotypified the name. As for some other taxa (see discussion under *D. aquifoliopsis*), Hochreutiner appeared to cite only the G duplicates of the syntypes (for *Jumelle 45*, this is determined by the omission of some label data from other duplicates as well as the failure to mention any other herbarium). Article 9.12 of the ICN implies that a cited syntype should have been chosen as lectotype in preference to an isosyntype but does not make this entirely unambiguous.

The type of *Dombeya majungensis* is an immature specimen of *D. tubulosoviscosa* that has small flowers in poor condition (hence, most measurements were excluded) and small leaves.

Additional specimens examined. MADAGASCAR. **Mahajanga:** Amboranio, near Majunga, *Perrier de la Bâthie 1240* (P).

Literature Cited

Arènes, J. 1958. Les *Dombeya* de Madagascar et des Comores. Candollea 16: 247–449.

Arènes, J. 1959. Sterculiacées. Fl. Madagasc. 131: 1–537.

Baillon, H. 1885a. Constitution du genre *Dombeya*. Bull. Mens. Soc. Linn. Paris 1(61): 481–483.

Baillon, H. 1885b. Liste des plantes de Madagascar (suite de la page 488). Bull. Mens. Soc. Linn. Paris 1(62): 491–496.

Bortolus, A. 2008. Error cascades in the biological sciences: The unwanted consequences of using bad taxonomy in ecology. Ambio 37: 114–118.

Cavanilles, A. J. 1786. Genera elucidanda in tertia dissertatione. Diss. 2, Secunda Diss. Bot., App. [1–3].

Cavanilles, A. J. 1787. Tertia dissertatio botanica. De *Ruizia*, *Assonia*, *Dombeya*, *Pentapete*, *Malvavisco*, *Pavonia*, *Hibisco*, *Laguna*, *Cienfuegosia*, *Quararibia*, *Pachira*, *Hugonia* et *Monsonia*. Diss. 3, Tertia Diss. Bot., 105–185, App. [1–3], tab. XXXVI–LXXIV.

Ellis, B., D. C. Daly, L. J. Hickey, K. R. Johnson, J. D. Mitchell, P. Wilf & S. L. Wing. 2009. Manual of Leaf Architecture. Cornell University Press, Ithaca.

Friedmann, F. 1987. Sterculiacées. Fl. Mascareignes 53: 1–50.

Hochreutiner, B. P. G. 1926. Monographie des *Dombeya* de Madagascar. Candollea 3: 5–120.

IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1 Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

Le Péchon, T., J. Y. Dubuisson, T. Haevermans, C. Cruaud, A. Couloux & L. D. B. Gigord. 2010. Multiple colonizations from Madagascar and converged acquisition of dioecy in the Mascarene Dombeyoideae (Malvaceae) as inferred from chloroplast and nuclear DNA sequence analyses. Ann. Bot. (London) 106: 343–357.

McNeill, J., F. R. Barrie, W. R. Buck, V. Demoulin, W. Greuter, D. L. Hawksworth, P. S. Herendeen, S. Knapp, K. Marhold, J. Prado, W. F. Prud'homme van Reine, G. F. Smith, J. H. Wiersema & N. J. Turland (editors). 2012. International Code of Nomenclature for Algae, Fungi and Plants (Melbourne Code). Regnum Veg. 154. Koeltz Scientific Books, Königstein.

Planchon, J. E. 1850. *Dombeya ameliae*. Fl. Serres Jard. Eur. 6: 225–227.

Schumann, K. 1900. Sterculiaceae Africanae. Pp. 1–140 *in* A. Engler (editor), Monographien Afrikanischer Pflanzen-Familien und-Gattungen, Vol. 5. W. Engelmann, Leipzig.

Seyani, J. H. 1991. The genus *Dombeya* (Sterculiaceae) in continental Africa. Opera Bot. Belg. 2: 1–186.

Skema, C. 2012. Toward a new circumscription of *Dombeya* (Malvales: Dombeyaceae): A molecular phylogenetic and morphological study of *Dombeya* of Madagascar and a new segregate genus, *Andringitra*. Taxon 61: 612–628.

Skema, C. & L. J. Dorr. 2010. *Dombeya gautieri* (Dombeyaceae), a remarkable new species from Madagascar. Kew Bull. 65: 305–310.

Vogel, S. 2000. The floral nectaries of Malvaceae sensu lato—A conspectus. Kurtziana 28: 155–171.

Appendix 1. List of Accepted Names.

1. *Dombeya apikyensis* Arènes
2. *D. aquifoliopsis* Hochr.
3. *D. midongyensis* Arènes
4. *D. ramiovensis* (Arènes) Appleq.
5. *D. decanthera* Cav.

5a. *D. decanthera* Cav. subsp. *decanthera*

5b. *D. decanthera* Cav. subsp. *farafanganica* (Arènes) Appleq.

5c. *D. decanthera* Cav. subsp. *latipetala* (Arènes) Appleq.

6. *D. lavasoensis* Arènes
7. *D. pilosissima* Appleq. & T. Andriam.
8. *D. australis* Scott-Elliot

8a. *D. australis* Scott-Elliot subsp. *australis*

8b. *D. australis* Scott-Elliot subsp. *grandiflora* Arènes

9. *D. capuroniana* Arènes
10. *D. mananarensis* Arènes
11. *D. mandenensis* Arènes
12. *D. mangorensis* Arènes
13. *D. ranofotsyensis* Arènes
14. *D. rariflora* Arènes
15. *D. gautieri* Dorr & Skema
16. *D. milleri* Appleq. & Bosser
17. *D. ratovosonii* Appleq. & Bosser
18. *D. ambalabeensis* Arènes

18a. *D. ambalabeensis* Arènes subsp. *ambalabeensis*

18b. *D. ambalabeensis* Arènes subsp. *ambongensis*

18c. *D. ambalabeensis* Arènes subsp. *analavelonae* (Arènes) Appleq.

19. *D. ambohitrensis* Arènes
20. *D. anakaensis* Arènes
21. *D. danguyi* Hochr.
22. *D. digyna* Hochr.
23. *D. micrantha* Appleq.
24. *D. parvipetala* Arènes
25. *D. sakamaliensis* Arènes
26. *D. selinala* Arènes
27. *D. sely* Arènes
28. *D. subviscosa* Hochr.

28a. *D. subviscosa* Hochr. subsp. *subviscosa*

28b. *D. subviscosa* Hochr. subsp. *ihosyensis* (Arènes) Appleq.

28c. *D. subviscosa* Hochr. subsp. *sakarahae* (Arènes) Appleq.
29. *D. tulearensis* Arènes
30. *D. vohemarensis* Appleq.
31. *D. andrahomanensis* Arènes
32. *D. decaryana* Arènes
33. *D. lecomtei* Hochr.
34. *D. lecomteopsis* Arènes
35. *D. longipedicellata* Hochr.
36. *D. merika* Arènes
37. *D. pauciflora* Appleq.
38. *D. seyrigiana* Arènes
39. *D. tavia* Arènes
40. *D. tsiandrensis* Arènes
41. *D. tubulosoviscosa* Hochr.

Appendix 2. Formerly accepted species and infraspecific names synonymized in this treatment or changed in taxonomic status, with indication of the accepted names for each.

Dombeya ambongensis Arènes subsp. *sakarahae* Arènes [= *D. subviscosa* Hochr. subsp. *sakarahae* (Arènes) Appleq.]
Dombeya ambongensis Arènes var. *ambongensis* [= *D. subviscosa* Hochr. subsp. *subviscosa*]
Dombeya ambongensis Arènes var. *fandrareensis* Arènes [= *D. subviscosa* Hochr. subsp. *sakarahae* (Arènes) Appleq.]
Dombeya ambongensis Arènes var. *ihosyensis* Arènes [= *D. subviscosa* Hochr. subsp. *ihosyensis* (Arènes) Appleq.]
Dombeya ambongensis Arènes f. *bevazahensis* Arènes [= *D. subviscosa* Hochr. subsp. *subviscosa*]
Dombeya anakaensis Arènes subsp. *multiflora* Arènes [= *D. anakaensis* Arènes]
Dombeya analavelonae Arènes [= *D. ambalabeensis* Arènes subsp. *analavelonae* (Arènes) Appleq.]
Dombeya andilamenensis Arènes [= *D. aquifoliopsis* Hochr.]
Dombeya ankarafantsikae Arènes [= *D. subviscosa* Hochr. subsp. *subviscosa*]
Dombeya australis Scott-Elliot subsp. *geayi* (Hochr.) Arènes [= *D. australis* Scott-Elliot subsp. *australis*]
Dombeya boeniensis Arènes [= *D. subviscosa* Hochr. subsp. *subviscosa*]
Dombeya cloiselii Arènes [= *D. selinala* Arènes]
Dombeya coursii Arènes [= *D. merika* Arènes]
Dombeya decanthera Cav. subsp. *meridionalis* Arènes [= *D. decanthera* Cav. subsp. *decanthera*]
Dombeya decanthera Cav. var. *bojeriana* (Baill.) Arènes [= *D. decanthera* Cav. subsp. *decanthera*]
Dombeya farafanganica Arènes subsp. *farafanganica* [= *D. decanthera* Cav. subsp. *farafanganica* (Arènes) Appleq.]
Dombeya farafanganica Arènes var. *linearis* Arènes [= *D. decanthera* Cav. subsp. *farafanganica* (Arènes) Appleq.]
Dombeya farafanganica Arènes var. *manakensis* Arènes [= *D. decanthera* Cav. subsp. *farafanganica* (Arènes) Appleq.]
Dombeya farafanganica Arènes [subsp. *endrina* Arènes] subvar. *endrina* [= *D. decanthera* Cav. subsp. *farafanganica* (Arènes) Appleq.]
Dombeya farafanganica Arènes subvar. *latipetala* Arènes [= *D. decanthera* Cav. subsp. *latipetala* (Arènes) Appleq.]
Dombeya farafanganica Arènes subsp. *ramiovensis* Arènes [= *D. ramiovensis* (Arènes) Appleq.]
Dombeya lecomtei Hochr. subsp. *trichostyla* Arènes [= *D. lecomtei* Hochr.]
Dombeya lecomtei Hochr. var. *minoriflora* Hochr. [= *D. lecomtei* Hochr.]
Dombeya lecomtei Hochr. var. *valamainty* Arènes [= *D. lecomtei* Hochr.]
Dombeya mafimafy Arènes [= *D. subviscosa* Hochr. subsp. *subviscosa*]
Dombeya majungensis Arènes [= *D. tubulosoviscosa* Hochr.]
Dombeya manaharica Baill. [= *D. decanthera* Cav. subsp. *farafanganica* (Arènes) Appleq.]
Dombeya mandoavato Arènes [= *D. lecomtei* Hochr.]
Dombeya meneriky Arènes [= *D. tulearensis* Arènes]
Dombeya subviscosa Hochr. var. *brevistaminodia* Arènes [= *D. subviscosa* Hochr. subsp. *subviscosa*]
Dombeya valafotsy Arènes [= *D. selinala* Arènes]
Dombeya vohitsiombeensis Arènes [= *D. selinala* Arènes]

Appendix 3. Index to Collectors. Collections are listed alphabetically by first collector's last name. Types are indicated in boldface. Numbers in parentheses correspond to those in the list of accepted species and subspecies.

Andriamihajarivo 1056 (16), *1098* (1), *1146* (13), *1683* (5c), *1736* (5c); *Andrianantoanina 151* (9); *Andrianjafy 1689* (20); *Applequist 248* (8b), *249* (5c × 8b), *255* (5c), *256* (8b), *257* (5c), *258* (8b), *262* (8b), *263* (5c), *264* (5c), *265* (8b), *266* (8b), *269* (28a), *270* (28a), *271* (28a), *272* (28a), *273* (28a), *274* (28a), *275* (28a), *276* (28a), *277* (28a).

Barnett 509 (28c); *Birkinshaw 425* (13), *449* (5a), *1318* (4), *1535* (26 × ?), *1648* (8a); *Boiteau 2533* (29), *2543* (33); *Bojer s.n.* (5a); *Bosser 9834* (4), *9836* (4), *17232* (18a), *17845* (33).

Capuron 1980 (**40**); *Chauvet 130* (20), *369* (18a × 20); *Cloisel 49* (26); *Commerson s.n.* (**5**); *Cours 271* (2), *275* (36), *1585* (36), *1663* (**36**), *5126* (29); *Croat 31072* (28c), *31073* (20), *31525* (24), *31945A* (33).

Debray s.n. Feb. 1972 (33); *Decary s.n.* 11 Mar. 1917 (24), *s.n.* 11 Mar. 1918 (24), *2542* (33), *2571* (33), *2632* (**21**), *2768* (33), *2993* (33), *3118* (**31**), *3505* (24), *3513* (24), *3544* (33), *3722* (**33**), *4169* (11), *4314* (13), *4660* (26), *4729* (5b), *4784* (**5b**), *5142* (**3**), *8478* (**24**), *8498* (24), *8554* (33), *8580* (33), *9049* (21), *9076* (33), *9542* (33), *9613* (33), *9931* (8a), *9934* (8a), *10177* (**13**), *13135* (**34**), *13173* (**32**), *16095* (**20**), *18530* (12), *18531* (**12**), *18924* (18a); *Déquaire 27507* (20), *27753* (**23**); *Descoings 628* (28), *649* (29), *2742* (26), *3239* (4), *3482* (28a); *Dorr 3057* (28a), *3991* (11); *Du Puy MB560* (29), *MB622* (20); *Dumetz 658* (11), *734* (11), *785* (11), *799* (14), *1164* (14).

Eboroke 797 (26), *812* (29), *996* (13 × 29).

Faliniaina 13 (11).

Gautier 4578 (**15**); *Geay 6717* (8a); *Gentry 11758* (22), *62096* (28A); *Gereau 3210* (14), *3359* (14); *Guillaumet 2485* (33).

Homolle 1434 (18a), *1752* (33); *Humbert 4090* (41), *12512* (**26**), *12688* (33), *12807* (29), *13047* (29), *13318* (**25**), *13331* (26), *13716* (33), *13758* (**10**), *13798* (**1**), *13813* (26), *14176* (33), *14177* (33), *14187* (38), *14316* (28c), *14333* (28c), *14453* (29); *19338* (18a), *19360* (18a), *19461* (**18**), *19757* (**18c**), *20192* (20), *28596* (28b), *28993* (14), *29019* (13), *29082* (5a), *29138* (26), *29152* (29), *29320* (**14**), *29552* (28c), *29562* (28c), *29650* (18a), *29659* (29); *Humblot 244* (5b).

Johnson s.n. (5a); *Jumelle 40* (**2**), *45* (**41**).

Keraudren 462 (28b), *815* (20), *1098* (18a), *1147* (36), *1539* (26), *1613* (19), *1619* (19), *1628* (19), *1675* (17).

Labat 2089 (20); *Leandri 4430* (26); *Lowry 5032* (33), *6730* (8a).

McPherson 14327 (11), *14767* (14), *14833* (11), *17148* (36); *Meyers 126* (28a); *Miller 10695* (**16**), *10704* (16); *Morat 3478* (18a), *4727* (18).

Nicoll 165 (20); *Noyes 1018* (28c).

Peltier 1357 (20), *5535* (18a), *5768* (18a), *Perrier de la Bâthie 594* (22), *1240* (41), *2186* (33), *2282* (28a), *5511* (**28**), *5516* (**35**), *5536* (**22**), *5617* (**2**), *12165* (**41**), *12166* (28a), *16656* (18a), *17732* (9), *17831* (35); *Petit s.n.* 1926 (**18b**), *s.n.* s.d. (35); *Phillipson 1726* (18a), *2488* (18a), *2499* (18a), *3104* (18a × 20), *3518* (33), *3532* (29), *5821* (33).

Rabarimanarivo 65 (5c); *Rabehevitra 941* (**30**); *Rabenantoandro 112* (5a), *351* (11), *421* (8b), *424* (8b), *793* (8b), *1768* (11); *Rabevohitra 1757* (11), *1798* (8a), *1894* (8a?), *2021* (11), *2051* (11 × 8a), *2101* (14), *2231* (29); *Rahantamalala 58* (20), *188* (28c); *Raharimampionona 75* (11); *Rajoharison 83* (8a), *181* (8b); *Rakotonandrasana 542* (5b); *Rakotonirina 277* (5c); *Rakotovao 5485* (33), *5493* (13); *Ramananjanahary 27* (19 × ?); *Ramison 214* (11), *241* (14), *370* (11); *Randriamampionona 117* (29), *133* (33), *288* (29), *420* (5a), *433* (5a), *835* (5a), *991* (13); *Randriambololona 87* (33); *Randrianaivo 97* (29), *862* (11), *1061* (18a), *1549* (29), *1718* (26); *Randrianasolo 342* (8a), *577* (11); *Randrianjanaka 169* (5b); *Randriatafika 73* (14), *365* (14), *711* (14); *Ranirison 591* (30); *Ratovoson 98* (13), *1265* (**17**), *1544* (26); *Ravololonanahary 93* (13); *Razafindraibe 179* (20); *Razafitsalama 579* (19), *1199* (16); *Razakamalala 1333* (30), *2470* (8b × 13?), *4271* (5a), *4329* (11), *4603* (8b); *Razanatsima 776* (**7**); *Reserves Naturelles 1867* (28a), *2123* (26), *2505bis* (29), *2509* (**29**), *2674* (26), *2749* (33), *2758* (26), *2760* (29), *2816* (28a), *2828* (28a), *2921* (28a), *3069* (**4**), *3145* (5b), *5022* (33), *5125* (28a), *5408* (28a), *5920* (5b), *6202* (26), *6207* (29), *6209* (26), *6753* (26), *6858* (35), *7351* (28a), *7742* (35), *8355* (26), *9180* (5b), *9440* (5a), *10070* (28a), *10289* (28a), *10305* (28a), *10692* (18a), *11445* (35) *13055* (5a); *Rogers 850* (29).

Scott Elliot 2524 (**8**); *Service Forestier 11* (28a), *17* [?] (28a), *28* (28a), *142* (28a), *369* (20), *511* (20), *2810* (**28c**), *3342* (28a), *3391* (18a), *3430* (33), *3489* (28a), *3531* (36), *3558* (19), *3556* (28a), *3802* (8b), *3960* (**39**), *4135* (18a), *4516* (20), *4535* (24), *4648* (18a), *4986* (18a), *5276* (**27**), *5292* (33), *5293* (29), *5357* (28a), *5744* (28a), *5876* (28a), *6765* (**40**), *7428* (8a), *8531* (26), *9209* (**8b**), *9223* (**11**), *10392* (28a), *11160* (18a), *11271* (**9**), *11638* (**28b**), *11716* (31), *11721* (33), *11783* (7a), *11821* (**6**), *11834* (26), *11836* (29), *11921* (28c × 20), *12391* (**5c**), *12943* (33), *13137* (**19**), *13736* (28b), *13789* (28b), *14012* (31), *14316* (24), *14480* (8b), *15081* (28a), *15598* (20), *15661* (21), *16200* (5c), *16370* (22), *16877* (36), *16938* (28a), *18110* (5b), *18536* (28a), *18598* (28c), *18697* (33), *19074* (28a), *19102* (28a), *19139* (28a), *19159* (28a), *19486* (28a), *19904* (28a), *20192* (20), *20441* (33), *20493* (33), *20504* (13), *20711* (18a), *20762* (20), *20988* (17), *22497* (29), *22499* (33), *22505* (33), *22510* (incertae sedis), *22533* (24), *22541* (24), *22590* (33), *22604* (29), *22612* (33), *22625* (29 × ?), *22628* (33), *22702* (30), *23242* (16), *23652* (5c), *23934* (8b), *26046* (28b × ?), *26053* (5a), *26789* (36), *28572* (6), *28576* (5a × ?), *29067* (18a), *29075* (**37**); *Seyrig 616* (**38**), *616B* (38); *Skema 52* (34); *Sussman 386* (18a).

Willing 35 (18a).

Zarucchi 7457 (8a).